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AN ANALYSIS OF UNIT COSTS
AT A CONSOLIDATED SUPPLY DEPOT

by

Kim C. Chojnowski
and
Robert W. Miller

December, 1990

Thesis Advisor: Joseph G. San Miguel

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The purpose of this thesis is to provide an analysis of the FY89 unit costs at a consolidated supply depot. The research focused primarily on the allocation schemes used for allocating general and administrative (G&A) and indirect costs at three sites of the newly consolidated supply known as the Defense Distribution Region West (DDRW) headquartered in Tracy, California. This is the prototype consolidated supply depot outlined in the Defense Management Review Decision (DMRD) Number 902. The three sites are the former Defense Depot, Tracy, California, former Sharpe Army Depot, Lathrop, California and the physical distribution department at the Naval Supply Center, Oakland, California. An overview of the Department of Defense's new unit cost resourcing system, including the terminology, concepts and formats of the unit cost reports, is also provided.

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An Analysis of Unit Costs
at a Consolidated Supply Depot

by

Kim C. Chojnowski
Lieutenant, United States Navy
B.A., Alvernia College
and
Robert W. Miller
Lieutenant, United States Navy
B.S., Indiana University

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Author: Kim C. Chojnowski
Kim C. Chojnowski

Author: Robert W. Miller
Robert W. Miller

Approved by: Joseph G. San Miguel, Thesis Advisor
Joseph G. San Miguel, Thesis Advisor

Glenn D. Eberling, Second Reader

David R. Whipple, Chairman
Department of Administrative Sciences

ABSTRACT

The purpose of this thesis is to provide an analysis of the FY89 unit costs at a consolidated supply depot. The research focused primarily on the allocation schemes used for allocating general and administrative (G&A) and indirect costs at three sites of the newly consolidated supply depot known as the Defense Distribution Region West (DDRW) headquartered in Tracy, California. This is the prototype consolidated supply depot outlined in the Defense Management Review Decision (DMRD) Number 902. The three sites researched are the former Defense Depot, Tracy, California, former Sharpe Army Depot, Lathrop, California and the physical distribution department at the Naval Supply Center, Oakland, California. An overview of the Department of Defense's new unit cost resourcing system, including the terminology, concepts and formats of the unit cost reports, is also provided.

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I. INTRODUCTION

A. THESIS OBJECTIVE

The purpose of this thesis research project is to examine how unit costs are defined and measured for the physical distribution functions at three supply depots in the newly consolidated Defense Distribution Region West (DDRW). The DDRW consists of the former Defense Depot, Tracy and Sharpe Army Depot and the physical distribution department of Naval Supply Center, Oakland.

Differences in unit cost assumptions, allocation schemes and unique missions at each of these activities will be investigated and analyzed. The intent of this research is to provide a management tool for the DDRW commander to use as a basis for comparison of unit costs at the various sites and for overall performance evaluation.

B. DECLINING RESOURCES

There are two realities concerning U.S. defense spending in the 1980's. The first reality is that during this period our government spent three trillion dollars on defense, the largest amount (in terms of real dollars) ever spent by a western government. The second reality is that since 1985 defense spending has been reduced at the average of 3% per year. During the first half of the 1980's, dollars for defense

spending were plentiful and defense managers concerned themselves with acquiring new weapon systems with little thought being given to the idea that someday the "well" would run dry.

Increased expenditures during the 1980's were not unique to the defense department as other federal departments and agencies also shared in these increased expenditures. This increased spending coupled with revenues increasing at a lesser rate during the Reagan years brought about an increase in the budget deficit each year. In 1985 the Gramm-Rudman-Hollings (GRH) Act set target goals for reducing the annual budget deficit. Reducing the deficit without increased taxes can only be accomplished through reduced government spending. Thus, the GRH Act signaled the fact that defense expenditures would be reduced in the future. In fact, with the exception of reducing Defense Spending, the GRH Act has been perceived as unsuccessful. The reduction of defense expenditures started under the Reagan administration and has continued under the Bush administration.

C. DIMINISHED SOVIET THREAT

Though the Gramm-Rudman-Hollings Act may be perceived as the catalyst for declining defense expenditures the reduced threat from the Soviet block during the late 1980's added serious momentum to the cry for reducing our defense forces/structure and the accompanying expenditures. To many

Americans, Mikhail Gorbachev's policy of Perestroika in the mid-1980's was the first sign that the Cold War was thawing. But it was the fall of the Berlin Wall in late 1989, the recent unification of Germany and the pending removal of Soviet troops from Eastern Europe which has convinced most Americans that the cold war is over and has caused great debate over the spending of the "peace dividend" made available from reduced defense expenditures. Except now the Iraq invasion of Kuwait has created uncertainty as to the future of defense expenditures.

D. DECISIONS FOR THE 1990's

In light of everything mentioned above, top defense officials were convinced in the late 1980's that defense spending would be reduced during the 1990's. In general, there are three possible ways to accomplish a reduction in defense expenditures.

The first way is to take a vertical cut. A vertical cut is the complete removal of a weapon system from the defense inventory. An example would be the mothballing of the navy's four battleships.

Taking a horizontal cut is the second way to reduce expenditures. A horizontal cut is the partial funding or partial removal of a weapon system. Examples would be the navy funding maintenance or overhauls at 50% of previous years' expenditures, the army reducing the frequency for overhauls of

tanks or the air force cutting by half the number of fighter squadrons in its inventory.

The third way to reduce defense expenditures is to make efficiency or productivity gains. Gains are accomplished by military services or units accomplishing the same taskings with reduced funding. This can only be done through a service or unit changing the processes by which it accomplishes its mission, i.e. eliminating waste or inefficiencies. An example of an efficiency gain would be the cost savings involved by consolidating each of the military services pay activities into one site or location.

E. FOCUS OF THESIS RESEARCH

Our thesis project will focus on investigating the third approach, namely an initiative to accomplish efficiency and/or productivity gains through consolidation and better cost planning and control. Though the innovative DOD concept of unit cost resourcing in itself will not generate gains or "cost savings", resourcing or budgeting by unit costs will motivate managers to analyze the processes by which he or she accomplishes their mission and improve efficiency and mission effectiveness.

Concerning unit costs, there are numerous cost issues which one could investigate or study. Although the idea of unit costs is relatively new to DOD (there are exceptions), the private sector has used concepts of unit costs for

decades. Any managerial or cost accounting text discusses in some length unit costs. For Defense contractors, the Cost Accounting Standards Board (CASB) provides guidance for contract costs. Unit costs include direct, indirect, and general and administrative (G&A) costs. For this research project we examine the indirect costs and G&A overhead allocation portion of the unit cost equation. To accomplish this we will investigate how total costs are derived, allocated, and calculated at three DOD supply depots, and what unique costs exist at each site.

The idea of using unit costs in DOD is a new, emerging area and many DOD managers have no experience with unit costs. Historical information on unit cost is extremely limited. Therefore, unit cost in the DOD arena is difficult to study using an analytical framework or model. Also the use of questionnaires to gather information is not possible because so little is known of the unit cost concept that formulating questions is premature. Field research was the only viable research technique available to gather information for this project.

F. PREVIEW OF CHAPTERS

The remaining thesis chapters will discuss as follows:

1. Chapter II. Background and History

To provide the reader with necessary perspective in this chapter we provide a discussion of unit costing in DOD

and background/history of each of the three sites, Tracy, Sharpe and Oakland, and their parent commands. We will also explain origins of the unit costing concept in DOD and the role of Defense Manpower Data Center (DMDC) and the services in providing unit cost information. We attempt to answer the who, what, when and where in this chapter.

2. **Chapter III. Methodology,Terminology,Concepts and Formats.**

This chapter presents the research methods and techniques that we used to perform our field work and why we chose those methods. Our research questions, as well as a statement of our hypothesis, will also be included.

3. **Chapter IV. Analysis of Research Data**

This chapter contains the data gathered during the research and analyses of the various research questions.

4. **Chapter V. Summary**

This chapter will provide our conclusions and recommendations and, also, questions for future research.

II. BACKGROUND AND HISTORY

This chapter provides background information on DOD's consolidation of the services supply depots, DOD's Comptroller's design of unit costs, and on the three site locations which we concentrated our research.

A. MILITARY LOGISTICS PRIOR TO 1989

The suggestion that the logistics branches of the military services are inefficient compared to private industry has a long history. Shortly after the end of World War II, former President Herbert Hoover chaired a presidential commission which recommended centralizing management of common military logistics support. In October 1961, the Defense Supply Agency (DSA) was established. The DSA was chartered to provide common supply and service support to the military services while remaining independent of the services. Congress, at that time, was concerned with the duplication of effort and waste associated with separate supply systems managing supplies commonly used by two or more services.

In July 1970 the Blue Ribbon Panel Report to the President and Secretary of Defense said:

> It is clear that significant military improvement can be achieved through the efficient, coordinated exploitation of new technologies in the areas of transportation,

communications, automatic data processing (ADP), and integrated procurement.

In 1976 DSA was renamed the Defense Logistics Agency (DLA) to reflect its broadened role in the military logistics system.

In 1982 the Wholesale Interservice Depot Support Study (WIDS) prepared by the Logistics Systems Analysis Office said:

> We examined the wholesale distribution system as an entity, identifying the relationships between material managers, depots and customers and the resulting distribution patterns. We observed a system which can only be characterized as sub-optimum. It is not a single system but five semi-autonomous systems which are loosely connected by very broad DOD policy guidance. Although each component has attempted to optimize its own system, there has not been a coordinated effort to optimize the DOD System as an entity.

The study also described how the typical customer receives material from 18 different depots, some located within 10 miles of each other, because the supply systems fail to act in unison.

B. DEFENSE MANAGEMENT REVIEW IN 1989

Today, a similar attitude persists and a new "consolidation" effort has taken place. During early 1989 the Defense Department, under the strain of reduced funding due to the federal budget deficit, initiated the Defense Management Report Consolidation Studies as a vehicle for identifying potential areas where cost savings could be achieved. Specifically, the Defense Management Review Decision (DMRD) 902, issued November 11, 1989, addresses the consolidation of

Defense Supply Depots. The goal being that such a consolidation would result in significant savings in a variety of areas: base and headquarters overhead costs, systems development costs, transportation costs, inventory costs, personnel costs (both military and civilian), etc.

C. CONSOLIDATED DEPOT: A PROTOTYPE

The San Francisco Bay Area was selected as the prototype for implementation of DMRD 902 with Deputy Secretary of Defense Donald J. Atwood approving the decision in April 1990. This area includes the physical distribution function at Defense Depot Tracy, California (DDTC), Sharpe Army Depot, Lathrop, California (SHAD) Sacramento Army Depot, Sacramento, California (SAAD), Sacramento Air Logistics Center, McClellan Air Force Base, Sacramento, California (SMALC), and Naval Supply Center Oakland, Oakland, California (NSCO). This consolidated activity is known as the Defense Distribution Region West (DDRW) and is under the organizational control of DLA. All of these physical distribution functions have either moved or will move under the control of DDRW. The entire Sharpe site, SHAD, moved under DDRW command in June 1990. Only the physical distribution department of NSCO was placed under DDRW in June 1990. This department is now referred to as the Oakland Distribution Site (ODS) or DDRW-ODS. The other departments of NSCO remained under the organizational control of the Commander, Naval Supply Systems Command. The three

sites at Oakland, Tracy and Sharpe will serve as the focus of our research project. The SAAD and SMALC sites are currently scheduled to transfer under DDRW command in January and July 1991, respectively.

D. TOTAL COST PER UNIT OF OUTPUT

The idea of using unit costs or "unit costing" for Department of Defense (DOD) activities was initiated by the Principal Deputy Comptroller of DOD Donald B. Shycoff in August 1989. In April 1990 Mr. Shycoff advised all of the military services and defense agencies that a DOD-wide cost per unit of output resourcing system would be developed for a number of functional areas to enhance visibility of costs and contribute to better management of resources.

In April 1990, Mr. Shycoff issued a memorandum to the Assistant Secretaries of the military services for financial management and the DLA comptroller outlining the primary total cost-per-output measures to be used in eight functional areas:

1. Supply Operations,
2. Supply Depots,
3. Health Care,
4. Recruiting
5. Base Operations
6. Military Training,

7. Depot Maintenance, and

8. Commissaries.

Historically, DOD commands have used some form of bottom line budgeting when allocating resources to supply depots. The primary goal for implementing unit costing resourcing is to influence DOD managers and workers to reduce the cost of doing business. Top DOD personnel believe that unit costs provide maximum visibility and flexibility in making tradeoff decisions between cost elements. There are five ways in which DOD personnel envision unit costs being used. Unit costs can be used to:

1. Improve operations,
2. Evaluate performance,
3. Evaluate budgets,
4. Support budgets, and
5. Make decisions.

E. ILLUSTRATION OF UNIT COSTS

To illustrate how unit costs will figure in the budgeting and resourcing process for DOD the following example is provided.

In the upcoming fiscal year (FY1) it is predicted that the Monterey Supply Depot[1] will be asked to perform a workload of

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[1]A hypothetical command.

1,000 units. During the current fiscal year (FY0) the supply depot performed a workload of 500 units at a total cost of $500. Therefore the unit cost for FY0 is $1 per unit. Based on this unit cost, Monterey Supply Depot will be budgeted $1,000 for FY1. This $1,000 is obtained by multiplying the expected workload (1,000 units) by the unit cost ($1.00 per unit). Using the DOD concept of resourcing and budgeting based on unit cost, an activity will only be funded for workload actually performed. In this example, if only 750 units are actually performed then they would only be allowed to spend funds up to $750 (750 units x $1 per unit). If on the other hand Monterey Supply Depot was tasked with performing a workload of 1200 units they would be allowed $1,200 which is in excess of the original budgeted amount.

The above example illustrates that budgeting is accomplished using predicted workload but resourcing or funding is based on actual workload. In each the base year cost is used to derive the dollar amounts. Note that funding is based on past unit costs and not on actual current unit costs. In the above example, if Monterey Supply Depot spends $1.25 per unit to perform a workload of 1,000 units (total cost of $1,250), they would still be funded at a rate of $1 per unit or $1,000.

Department of Defense officials feel that resourcing at the past unit rate and for actual units of work performed will cause managers to control or evaluate more carefully the

events that drive the cost of their activity. This approach to DOD resourcing closely resembles recent emphasis on activity based costs and cost drivers in the private sector and is completely different from the bottom line budgeting which has been prevalent in DOD. Bottom line budgeting allowed managers a fixed amount of resources to use during the period regardless of workload. If the workload did not materialize (along with the associated costs) then managers were not required to scrutinize cost and cost drivers. When resourced via the bottom line budgeting process, managers only worried if workload exceeded predicted amounts since costs required to complete the additional workload had not been budgeted for.

F. UNIT COST LITERATURE

A quick review of cost accounting books coverage of unit costs is warranted.[2] The general agreement is that unit costs are: a total cost divided by some related measure of activity or output such as manhours used, machine hours or units produced. Total costs are comprised of fixed costs and variable costs.

Indirect costs are merely those costs which have no direct observable relationship to output. Some components of fixed costs may vary from period to period but do not vary in direct

[2]Several of the Cost Accounting textbooks reviewed are: Deakin and Maher (1987), Fischer and Frank (1985) and Horngren (1972).

relationship to changes in activity or output measures in the short run. Some fixed costs are controllable by the manager (repairs and maintenance) and some are not (depreciation). Fixed costs which may be changed by management decision in the short term (1 year or less) are sometimes referred to as discretionary fixed costs while those costs which are not currently controllable are referred to as nondiscretionary or committed fixed costs. In the long run though all fixed costs may change.

Variable costs are those costs which vary in direct proportion with the increase or decrease of output. An example of a variable cost is the labor required to paint a building. If painters receive $7 per hour for their labor, two hours of painting will cost $14. Thus, total labor cost will vary in direct proportion to the number of labor hours.

One of the most common mistakes when analyzing unit costs is to regard all of the unit cost as variable. Changes in output or activity (the denominator in the unit cost equation) will affect total variable costs but not total fixed costs. Total fixed costs remain constant in the short term. Due to the fact that the existing accounting systems are unable to identify and support fixed costs, as stated in the DOD Unit Cost Resourcing Guide, current DOD policy is that unit costs assume that total costs are variable costs. This guide also states that until such time as variable and fixed costs are distinctly definable and supportable, all costs will be

treated as variable. This implies that DOD will develop models to identify fixed and variable costs in the future.

G. BACKGROUND ON RESEARCH SITES

In the remainder of this chapter we will focus on providing background on the specific sites under study (Tracy, Sharpe, Oakland) and provide a detailed outline of their past and present organizational (command) structure, resourcing techniques, customer base, inventory composition and unique supply missions. Each of the sites will be addressed separately. These three sites were chosen for study because of (1) their proximity to the Naval Postgraduate School, (2) limited time to execute research, (3) financial constraint in travel funds and (4) these three sites have already been consolidated.

TABLE 1

FY 89 SITE DATA

	Gross square feet of storage	Personnel	Inventory Value	Operating Budget
Tracy	4.9 million	1,700	$1.2B	$72M
Sharpe	3.8 million	1,200	$1.3B	$63M
Oakland[3]	7.1 million	700	$4.2B	$72M

[3]Personnel total includes only physical distribution personnel.

H. SPECIFIC SITE-OAKLAND

The Naval Supply Systems Command (NAVSUPSYSCOM), as the logistics arm of the United States Navy, consists of the following:

1. Headquarters staff
2. Two Inventory Control Points (ICPs)
3. Eight Naval Supply Centers (NSCs)
4. Four Navy Regional Contracting Centers (NRCCs)
5. One Central Design Agency (CDA)
6. Navy Resale System
7. Navy Publications and printing service
8. Other field activities in support of specific aspects of the NAVSUP mission.

NAVSUPSYSCOM's mission is to provide material support (acquisition and fleet support) needs of the Navy for supplies and supporting services by developing and promulgating Navy policies and methods for the supply, safeguarding, distribution and disposal of naval materials; providing assigned supplies and services, including the resale services, to naval units and other authorized customers; managing subordinate activities; providing technical guidance and direction to naval activities concerning execution of supply policies and methods; and coordinating Navy requirements with the Defense Supply system.

The Naval Supply Center (NSC) in Oakland, California is one of the eight NAVSUP NSCs. Of the eight NSCs, Oakland ranks first in gross square footage of storage; second in line items carried and net square footage of storage; and third in inventory value, average monthly issues and average monthly receipts. The NSC at Oakland was established in December, 1941. It is the principal distribution point for supply support of fleet operations in the Pacific and Indian oceans. Three different sites make up NSCO; (1) the 541 acre main site at Oakland, (2) the Point Molate Fuel Facility located at the Port of Richmond (California), and (3) the Alameda Annex/Facility and Aviation Supply Department in Alameda, California. The main site plays host to approximately 30 tenant activities and is the homeport for three USN ships and 28 Military Sealift Command (MSC) Pacific ships. During World War II, at the height of its activity, the supply Depot, as it was then known, employed 16,000 naval and civilian personnel. Today there are 58 military and just over 1700 civilian personnel with an annual payroll of $45.9 million. The recent consolidation, in June, 1990, shifted approximately 700 civilian and 11 military personnel in the physical distribution function from NSCO to DLA organizational control.

I. SPECIFIC SITE-TRACY

Tracy is the westernmost depot in the DLA distribution system. It was established in January 1963 and is situated on

448 acres of government owned land. There are 4.5 million gross square feet of covered space, 62,000 gross square feet of refrigerated space and 2.4 million gross square feet of open improved storage area at Tracy. This particular site is ideally located near the hub of all major types of transportation:

1. Aircraft facilities at Travis Air Force Base, 65 miles to the northeast and at least three major metropolitan or international airports within a 100 mile radius.

2. Rail transportation is available from two major railroads, Southern Pacific and Union Pacific, with 18 miles of internal rail track on the site itself. The Santa Fe rail line is 20 miles north in Stockton.

3. Deep water facilities are located at the Port of Stockton, 20 miles north, and the Port of Oakland is located 60 miles west.

4. Several major interstates, 5, 580 and 205 serve the Tracy area and California State Route 99 is also nearby.

The supported customer base consists of all the military services (Army,Navy,Marines and Air Force) and other specified federal agencies located in California and the southwestern United States and Pacific overseas areas. In addition to general military supplies, Tracy also provides direct support of semi-perishable food to selected Army and Air Force overseas commissaries, military bases on the west coast, naval stations in the pacific region and ships of the Pacific Fleet stationed in the Oakland-San Francisco Bay area. The ships are reprovisioned from a 300,000 square foot warehouse located in Alameda.

The total 1989 annual operating budget for Tracy is approximately $72 million, $47 million of which goes for payroll. The work force consists of 1,700 civilians and 17 military personnel.

J. SPECIFIC SITE-SHARPE ARMY DEPOT (SHAD)

The SHAD site is the former Sharpe Army Depot. Prior to consolidation it was one of 18 depots under the U. S. Army Depot System Command (DESCOM). There were 12 depots and 5 depot activities located in the United States and one in Germany. Sharpe is one of three geographic area oriented depots (AOD) and its supply responsibilities cover storage and distribution operations for supplies destined for Alaska, Hawaii, Guam, Okinawa, Japan, Korea and the eight westernmost U. S. states. SHAD was officially established in 1942 as the Lathrop Holding and Reconsignment Point. In 1948, a new name, Sharpe General Depot was assumed.

Situated on 724 acres, the facility includes eight million square feet of improved storage space with almost 2 million covered and 3/4 million in controlled humidity warehousing. A new state-of-the-art distribution facility was constructed in 1986. Future plans under consolidation call for optimal use of this new Western Distribution Facility (WDF) with Sharpe and Tracy serving as the primary hub for receiving, issuing and storage.

Sharpe is located in Lathrop, California, seven miles south of Stockton and 16 miles north of the Tracy site. The watercraft section of Sharpe is located at Rough and Ready Island which is adjacent to the Port of Stockton, the largest inland deepwater seaport in California. This channel leads to the Port of Oakland, one of the world's largest containerization ports. Sharpe serves as the consolidation and containerization point for shipments from other Army depots, DLA, GSA and other sources to Army customers in Alaska, Hawaii, Japan, Korea and the Pacific Basin region.

Travis Air Force Base is only 60 miles northwest of Sharpe and can handle the largest military aircraft for air shipments. In addition, the Stockton Metropolitan Airport is only 3 miles north and can accommodate the largest military and commercial cargo aircraft.

The 1989 annual operating budget exceeded $63 million and the employee payroll topped $32 million. The work force consists of 1,200 civilians and 32 military personnel and approximately 100 contract workers.

Sharpe was funded under the Army Industrial Fund (AIF). The AIF is a revolving fund. Industrial Funds are working capital funds which are used to finance work that will be paid for by the customer after the work has been completed.[4] The

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[4]Practical Comptrollership Course Guide, Naval Postgraduate School, Monterey, California, March, 1990, p. H-3.

Department of Defense considers Industrial Fund accounting as a management tool to assist in controlling the costs of goods and services in profit centers where the objective is to breakeven. All of Sharpe's customer support missions were funded by the customer using Operations and Maintenance, Army (O&M,A) funds which then reimbursed the AIF services provided. The recent transition to DLA will now have the customer paying with O&M,A but reimbursing the Defense Stock Fund. In the AIF funding arena, a two week capital turnover system is employed. This means, for example, that a two week allotment of money is provided up front from the AIF and bills to the customer for the exact amount of services provided must be generated by the end of the two weeks. Under the Army, lines of work for the entire year were provided to DESCOM by individual commands (customers) and DESCOM advised the depots as to what workload to anticipate for the fiscal year. Unplanned requirements could be submitted throughout the year. The important concept here is that customers are paying for service (i.e., accessorize a barge, set up a field kitchen) and not for the material.

K. FUTURE CONSOLIDATION SITES

The current consolidation plan calls for Sacramento Army Depot (SAAD) to move under DDRW command in January, 1991 and Sacramento Air Logistics Center (SMALC) in July, 1991. These two activities, like the Oakland site will retain

responsibility for consumer stocks, local purchase support for local units and customer service functions. A detailed profile has not been provided due to limited time and financial resources. However, the analysis provided by the research at the other three sites will be sufficient to serve as a baseline for comparison and further studies.

In this chapter we provided a background of the various efforts which have been undertaken to improve the efficiency of DOD supply activities, including the most recent recommendations made in the Defense Management Review. We then discussed the concept of unit costs and closed with background and history of the three sites researched.

Next in Chapter III, we will present the methodology of our research effort and the terminology, concepts and report formats used in DOD's unit cost resourcing system.

III. METHODOLOGY, TERMINOLOGY, CONCEPTS AND FORMATS

In this chapter we will present the terms and concepts underlying unit cost, the methods by which we collected the unit cost data for our study and assumptions that were made to expedite the research. Additionally, we will provide the terms, definitions and concepts associated with DOD's unit cost system and a brief explanation of the format of the unit cost reports. According to DOD guidelines, once implemented, unit cost data will be used by DOD managers to:

1. Reduce the cost of doing business,
2. Improve operations,
3. Measure improvements,
4. Evaluate and support budgets, and
5. Make decisions.

A. RESEARCH METHODS USED

Our primary research questions address how costs are defined, measured and allocated at Tracy, Sharpe and Oakland and what unique cost assumptions, allocations and missions exist at each site.

Due to an evolving field of change and policies and because there is limited historical data we could not use questionnaires or perform in-depth statistical analysis. Our

research was conducted during an evolutionary process (implementation of unit costing and consolidation) and therefore field research was our best means of gathering data.

We supplemented our field research with (1) library research to provide us with background on similar private sector initiatives in unit costing, (2) a review of DOD guidelines, memoranda, and drafts of documents pertinent to unit costs, (3) personal interviews conducted with key personnel involved in unit costing, and (4) a review of initial and follow-on unit cost reports generated by the Defense Manpower Data Center (DMDC) for the Tracy, Sharpe and Oakland sites as well as interviews with key DMDC personnel.

B. SITES CHOSEN

Although there were five sites identified for the prototype consolidation at DDRW, we chose only three sites for research because of time and financial limitations. The three sites chosen were the closest to the Naval Postgraduate School, Monterey, California, the base from which the research project was conducted. Additionally, as previously mentioned, due to the new subject area no past data are available for statistical or trend analysis and no knowledge or expertise exists. We judge these three research sites to be representative of the broad unit cost issues at other depots.

C. DOD GUIDELINES

The DOD guidelines we reviewed provided us with initial insight into DOD's approach to unit costing. Joint Service, Defense Agency and OSD task forces were charged with identifying organizational outputs, determining what data was required to unit cost and how to capture the required data from existing individual accounting systems.

D. ROLE OF THE DEFENSE MANPOWER DATA CENTER

The Defense Manpower Data Center (DMDC) in Monterey, California was tasked by OSD to develop the unit cost report system. This activity is a management information support group to the Office of the Assistant Secretary of Defense (Force Management and Personnel). It is chartered to provide a facility within DOD for the collection and analysis of manpower data extracted from files maintained by DOD components and other Government agencies. There are approximately 125 civilian data analysts and programmers employed at DMDC and computer support for the databases is provided by the W.R. Church Computer Center at the Naval Postgraduate School, Monterey, California.

The Department of Defense chose DMDC for the following reasons:

1. DMDC is considered to have the unique ability to do this type of work.

2. DMDC is considered to have the most responsive ADP facility.

3. The unit cost data will use manpower and base operations data which DMDC already processes.

4. DMDC's capacity is unconstrained and the unit cost system is a large project.

The unit cost report system entails extracting raw data from the individual accounting systems and redisplaying this data in a unit cost format. The format of the unit cost reports will be discussed later in this chapter.

Each of the services and DLA submitted financial data to DMDC to be used in generating the unit cost reports. Magnetic tapes were used to transmit most of this information. Financial data, manhours, cost codes and work units were provided on a single tape from headquarters activities for DLA, Army and Air Force supply depots. For these activities financial information is forwarded to their respective headquarters on a routine basis and it was easiest for the headquarter activities to provide the financial information on a single magnetic tape for all of their subordinate commands. For the Navy, financial data, manhours and cost codes were provided by the individual supply depots and the work unit counts were provided by NAVSUP. Appendix A at the end of this thesis illustrates the cost codes which are used by DLA activities. A description of what is included in each of these cost codes can be found in DLA Accounting and Finance Manual,

DLAM 7000.1 Change 14. In addition, Appendices B and C[5] illustrate the cost codes used by Navy and Army supply depots respectively.

E. MEASURES OF OUTPUTS

The DOD handbook, "Unit Cost Resourcing Guide, INTERIM", 10/5/90 defines two types of outputs, primary and other.

Primary outputs are those outputs that reflect the primary mission of an organization. These outputs are determined by answering the question, "What is the main operation or service the organization performs?". It is important to identify as few primary outputs as possible to avoid fragmenting the organization and defeating the purpose of managing total costs. It is also important to maintain visibility of distinct functions and, therefore, not aggregate or combine outputs haphazardly. The primary output measure should represent the most important mission of the organization. It will then become the common denominator for planning and controlling operations and mission execution.

The primary outputs for Supply Depots, our research area, have been identified as "line items received" and "line items issued." This is consistent with the primary mission of supply depots which is to receive, store and issue material. We did not research the question of whether or not these are

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[5]The source documents for appendices A,B and C were from computer printouts provided by DMDC.

appropriate measures of output. However, similar output measures are used in private sector organizations involved in comparable operations.

1. **LINE ITEMS RECEIVED:**

A line item <u>received</u> refers to a single receipt of a National Stock Number (NSN) on a receipt document to include new procurement, redistributions, and customer returns. Each receipt document can contain only one NSN. As an example, a receipt of one box of ball point pens and the receipt document for this one box of ball point pens counts as one receipt. Also, a receipt of ten trailers of Xerox copier paper and a single receipt document for all of the paper counts as one receipt. The number of receipts credited to an activity depends on the number of receipt documents and not on the quantity on each document or on the dollar value of the receipt. In this system, it doesn't matter if you receive one box of pens valued at $3.00 or one submarine propeller valued at $250,000 because all receipts are counted the same way.

2. **LINE ITEMS ISSUED**

A line item <u>issued</u> refers to a material release order (MRO) and only one NSN item can be issued per MRO. Just as in the case of receipts, the number of issues is determined by the number of issue documents and not by the quantity on each document or on the dollar value of the document.

3. OTHER OUTPUTS

There are other tasks which are performed by an activity which cannot be identified with the activity's primary mission or primary outputs. A host activity providing tenant services (utilities, office space, buildings, etc.) is a good example of other outputs. These other outputs must be identified to ensure that all costs associated with an activity are being captured. Other outputs may be expressed in cost-per-unit basis, on a reimbursable basis or up to a preset ceiling. Other outputs may be resourced via the traditional budgeting method (bottom line budgeting) or reimbursed on a cost-per-unit basis if that data are available in the future.

Chapter IV will provide examples of the other outputs at the three research sites.

Overall, the outputs, once identified, can now be related to the functions performed by the individual activity. Therein, lies the management tool, cost-per-output, that will assist managers in identifying areas in need of improvement and also provide a measure for improved efficiency.

Once all costs for a cost center have been identified cost goals can be assigned. These cost goals reflect the operations of that particular cost center and the costs that are within its control. All of the costs of the cost centers can then be rolled up into an entire activity goal.

F. CATEGORIES OF COST

The next area of importance in unit costs is determining the categories of cost. The DOD handbook, just like a private sector business, identifies three categories of costs. These categories are direct, indirect, and general and administrative costs.

1. DIRECT COSTS

Direct costs are those costs clearly identified or traced to a product or output and are carried 100% by the function that produces output, such as hands-on labor or material used in making or shipping the product. Direct operating costs are incurred by first line entities solely to benefit a specific output. Second line supervision, for example, does not provide direct benefits to a specific output so it is not considered a direct cost.

2. INDIRECT COSTS

Indirect costs are those costs of a department or activity which cannot be identified or traced to a single output or product. These costs are generally allocated over a select number of outputs, or allocated over all of the outputs of an activity, depending on their individual nature. All costs that benefit more than one output will be considered indirect with the exception of those covered by general and administrative costs (defined below). An example of an indirect cost is second line supervision or the cost incurred

with operating material handling equipment. The physical inventory function or rewarehousing[6] efforts would also be examples of indirect costs.

3. GENERAL AND ADMINISTRATIVE COSTS

The final category of costs, general and administrative (G&A) costs, are those costs that are essentially considered overhead. That is, the management, clerical and administrative costs of the operating segment. These costs cannot be reasonably associated with any output or even groups of outputs and are allocated over all of the outputs or products. These types of costs generally include local command and control personnel, comptroller, medical, training, security, facilities engineering, legal services, fire protection, custodial services, snow removal and other similar activity support functions. For our research we selected only the "indirect" costs and "G&A" costs for examination as these costs must be allocated for unit cost purposes. Direct costs are not examined here. Our assumption is that these costs are accurately gathered and reported.

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[6]Rewarehousing is a term used to describe the process of moving material within an activity. Examples of why you would rewarehouse are: (1) moving material to consolidate all of a given item in one location or (2) moving a fast moving item to a bin or carousel storage location to gain efficiency in the receipt or issue process.

G. OTHER TERMINOLOGY

The terms "overhead" and "indirect costs" are sometimes used interchangeably in the DOD unit cost system and in industry. Additionally, the term "allocated costs" is used to describe the combination of indirect costs and G&A costs in the DOD unit cost computation.

The output measures, "issues" and "receipts", may also be referred to as work units or workload.In addition to issues and receipts there are other missions or functions that an activity may perform. These are referred to as "uniques". Examples of uniques are the functions of procurement, financial services and household goods shipment and receipt. These functions may be a primary output of the activity but are not related to the primary output measures of issues and receipts.

The term "productive manhour" is used to distinguish those hours an individual spends performing his or her basic task. For example, an individual who works in the receiving area normally works eight hours each day. Of these eight hours, the individual may spend six "productive manhours" processing receipts and two manhours receiving training. The individuals time card will reflect the number of hours and the corresponding cost codes[7] of the various functions which they performed on that day. The information on the time cards is

[7]As in Appendices A,B and C.

used both to pay the individual and to generate financial information. Examples of the type of financial information are (1) productive manhours spent processing receipts, (2) quantity of dollars spent on making issues and (3) number of hours spent training personnel.

The sum of all productive manhours should be viewed as "direct labor" similar to private industry for a division or whole company. It is a measure of the efforts consumed by each activity (i.e., issues,receipts,uniques).

H. COST DATA

Fiscal year[8] 1989 cost data were used because as of the time of this research project all of fiscal year 1990 data had not been submitted to DMDC for the three sites under research. Additionally, DMDC had complete data for 1989, which is the baseline selected by DOD for unit costing of supply depots.

I. UNIT COST REPORT FORMAT

What we refer to as the unit cost report is officially known as the "Depot Cost, Manpower and Workload Analysis Report". Despite this official title, everyone we had discussions with at OSD, DMDC, and the three research sites referred to the reports as "unit cost reports" and we will

[8]Fiscal years run from 01 October of one year until 30 September of the next year.

continue to refer to the reports by the unofficial term of "unit cost reports."

The generic unit cost report consists of two parts. Part I is titled "Manhour Profile and G&A Allocation" while Part II is titled "Costs and Workload." In this section we will discuss what information is provided in both of these parts of the unit cost report.

1. PART I. MANHOUR PROFILE AND G&A ALLOCATION

Part I of the report provides the distribution of the allocated[9] costs of the activity to the primary outputs and other outputs. In general, both G&A and indirect/overhead costs are allocated based on productive manhours.

As an example we will once again use our hypothetical command, the Monterey Supply Depot. During the year the Monterey Supply Depot had $300 of G&A costs. Additionally they spent 200 productive manhours processing receipts, 300 productive manhours making issues and 100 productive manhours producing other outputs. The total productive manhours for the year was 600. Based on the percentage of manhours used each output would be allocated a share of the G&A costs. Receipts would be allocated 33.3% or $100 of the G&A costs.[10] Likewise, issues and other outputs would be allocated 50%

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[9]Both G&A and Indirect/overhead costs.

[10]Receipts had 200 of the 600 total manhours.

($150) and 16.7% ($50) of the G&A costs respectively. Under this method all $300 G&A costs are allocated to some output.

Indirect/overhead costs for the Monterey Supply Depot would be allocated under the same method except productive manhours spent supervising workers would not be included in the productive manhour totals. Since supervision is considered an indirect/overhead cost which is allocated to outputs, the productive manhours spent incurring these supervision and other indirect costs are excluded from the base. To continue our example, the Monterey Supply Depot had $200 of indirect/overhead costs. Of the 200 productive manhours spent processing receipts, 40 of the manhours were due to the supervisors. Likewise, there were 50 manhours of supervision in the issue function and 10 manhours spent supervising the other outputs. After excluding the supervisors' manhours the total manhours to be used to allocate indirect/overhead costs is 500. Indirect/overhead costs would be allocated on the following basis; $64 to receipts, $100 to issues and $36 to other outputs.

The total allocated costs for the Monterey Supply Depot is $500. Of the total allocated costs, receipts would have been allocated $164, issues would have been allocated $250 and other output $86.

This is a brief summary of the information which is contained on Part I of the unit cost reports for supply depots. The key item to remember is that G&A and

indirect/overhead costs are allocated based on manhours. Additionally, the manhour totals and the G&A and indirect/overhead costs are provided to DMDC by magnetic tape from the military services and DLA.

Table 2 provides a sample Part I unit cost report for our hypothetical Monterey Supply Depot.

TABLE 2

PART I: MONTEREY SUPPLY DEPOT UNIT COST REPORT

	G&A Manhours (%)	Ind/Ovhd Manhours (%)	G&A Costs	Ind/Ovhd Costs	Total Costs[11]
Receipts	200 (33.3)	160 (32.0)	100	64	164
Issues	300 (50.0)	250 (50.0)	150	100	250
Other[12]	100 (16.7)	90 (18.0)	50	36	86
Total	600 (100)	500 (100)	300	200	500

2. PART II. COSTS AND WORKLOAD

Part II of the unit cost report provides the total costs associated with outputs, the workload count of the output (if there is an associated work measure) and the unit cost for the output.

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[11]Total Allocated Costs equals sum of G&A and indirect/overhead costs.

[12]"Uniques."

The total costs associated with an output include labor (direct and indirect), non-labor (direct and indirect) and the allocated costs (G&A and indirect/overhead). The labor and non-labor costs and workload counts are taken from the financial records provided to DMDC from the respective services and DLA. The total amounts of allocated costs are those calculated on Part I of the unit cost report.

Table 3 provides a sample Part II unit cost report for our hypothetical Monterey Supply Depot.

TABLE 3

PART II: MONTEREY SUPPLY DEPOT UNIT COST REPORT

	Labor	Non labor	Allocated[13]	Total Costs	Workload
Receipts	$500	$100	$164	$764	100
Unit Cost	$5.00	$1.00	$1.64	$7.64	
Issues	$750	$250	$250	$1,250	500
Unit Cost	$1.50	$.50	$.50	$2.50	
Sub-Total	$1,250	$350	$414	$2,014	600
Unit Cost	$2.08	$.58	$.69	$3.35	
Other	$250	$75	$86	$407	N/A
Total	$1,500	$425	$500	$2,421	N/A

From Part II of a unit cost report you can obtain the unit cost for receipts, issues and the combination of both of

[13]From Part I of the unit cost report. See Table 2.

these outputs. Unit costs are derived by dividing the cost by the workload. Our example was simplified but the labor and non-labor columns can include both direct and indirect non-labor costs.

J. COST DRIVERS

Another important concept when dealing with unit costs is that they provide visibility of cost drivers. Visibility of cost drivers allows the manager to determine if the best output measurement is being used. For example, the supply depot might want to look at tonnage moved, both received and issued, as the denominator in the cost equation. Once the total costs have been captured various analyses can be performed.

In summary, the unit cost system provides both visibility and flexibility to managers. No savings can be directly attributable to unit costing, but rather savings realized will result from changing or eliminating processes. Our research questions and methods attempt to outline the specifics of unit costs at three individual locations while keeping in mind their unique missions and areas of concern. Chapter IV will expand on the research questions at each site. We will also speculate on the effects of consolidation at these sites and how unit costs might be effected.

IV. ANALYSIS OF THE RESEARCH DATA

In this chapter we will analyze the allocated costs portion of the unit cost equation at Tracy, Sharpe and Oakland. Chapter III has described the general approach and terminology used in unit costing within DOD.

A. COST ALLOCATION SCHEMES

When this thesis research project was started we believed that each of the three sites under research would allocate G&A and indirect costs differently. We believed this because specific guidance was not provided by DOD as to how to allocate indirect and G&A costs. Thus, each of the services and DLA might choose different means of allocation. Also, the services and DLA have a long history of using different methods to solve essentially the same problem so we felt that this would be another instance of a difference of methods.

Our research determined that both indirect and G&A costs were allocated to output measures based on manhours. Department of Defense officials gave each service and DLA the opportunity to allocate these costs by any means they desired but all concerned chose to allocate indirect and G&A costs based on manhours. Allocation could have been based on a variety of choices. Other examples of a basis by which

allocated costs could have been allocated are by using labor dollars or number of employees.

G&A costs are allocated by large companies such as General Electric on basis of "sales" of divisions or profits of divisions. On the other hand, the CASB forced defense contractors to use "total cost input" or some other base than sales for G&A expense allocations to defense contracts.[14]

Each activity's accounting records were used to determine how many "productive" manhours had been charged to each of the outputs and uniques for both the indirect and G&A costs. As an example, in Figure 4-1 we see that for issues there were 818,677 productive manhours used in calculating the share of G&A costs attributed to issues and 413,174 manhours used in calculating the share of indirect costs (called overhead in the report) attributed to issues.[15] The 818,677 manhour figure is the total number of productive manhours used to make the 1,267,642 issues.[16] This number includes both direct labor manhours and indirect labor manhours traceable to issues. Recall that indirect labor includes second line supervision and other labor costs which benefit two or more outputs but not all outputs. The difference between the

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[14]This requirement can be found in CAS 410, Allocation of Business Unit G&A Expenses to Final Cost Objectives.

[15]Figure 4-1 contains Part I, Manhour Profile and G&A Allocation for Oakland for FY89.

[16]This number comes from Figure 4-2 which is the Part II, Costs and Workload for Oakland for FY89.

818,677 and 413,174 productive manhour amounts, infers that there were 405,503 indirect manhours involved in making the 1,267,642 issues. Since these 405,503 manhours are indirect, they were not included in the manhour totals used to allocate indirect costs.

B. TREATMENT OF SUPERVISION MANHOURS

The reader will note that for all three research sites this difference between manhours used in calculating G&A and indirect costs is true for issues only. For receipts, the manhours used to calculate G&A and indirect costs are the same. At first glance it appears as if the receipt function does not require second line supervision (indirect labor costs) but that the issue function does require second line supervision. This is not true. A conscious decision by DOD and DMDC was made to allocate all of the second line supervision to issues for two reasons. First, the present accounting systems are not sophisticated enough to differentiate between the time a second line supervisor spends with individuals making an issue or receipt. Second, issues make up a majority of the workload at each of these three sites and in fact at most DOD physical distribution activities.[17]

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[17]Issues are 75% of the workload at Oakland, 90% at Tracy and 84% at Sharpe.

DI:OT COST MANPOWER AND WORKLOAD ANALYSIS REPORT
NAVY
OAKLAND NAVAL SUPPLY CENTER
DISTRIBUTION FUNCTIONS
PART I MANHOUR PROFILE AND G & A ALLOCATION
FISCAL YEAR 89

RUN DATE: 08/24/90
RUN TIME: 09.39.39

	G&A MANHOURS MIL	CIV	%	OVERHEAD MANHOURS MIL	CIV	%	ALLOCATED G&A COSTS	ALLOCATED OH COSTS	ALLOCATED TOT COSTS
CONSOLIDATED FUNCTIONS-STOCK FUND									
RECEIPTS	0	233,220	9.33	0	233,220	23 94	2,945,226	2,030,907	4,976,133
ISSUES	0	818,677	32 76	0	413,174	42 42	10,338,679	3,597,964	13,936,643
TOT DLA DISTRIB	0	1,051,897	42 10	0	646 394	66.37	13,285,905	5,628,871	18,912,777
OTHER CONSOLIDATED FUNCTIONS-O&M									
LOCAL DELIVERY	0	162,71[illegible]	6 51	0	162,711	16.71	2,054,794	1,416,901	3,471,695
TOT CONSOLID FUNCTS	0	1,214,608	48.61	0	809 10[illegible]	83 07	15,338,699	7,045,773	22,384,472
NAVY FLEET&INDUST SUPPORT CTR-SF									
FINANCIAL INV ACCTG	0	3[illegible],191	[illegible] 53	0	0	00	48[illegible],29[illegible]	0	482,293
INVENTORY MANAGEMENT	0	49,930	2 00	0	49,936	5 13	630,62[illegible]	434,850	1,065,470
TECHNICAL SERVICES	0	15,069	.60	0	15,069	1 55	190,302	131,225	321,527
OUTFITTING	0	63	.00	0	63	01	789	544	1,334
REPAIRABLE MGMT	0	89,724	3 59	0	89 724	9.21	1,133,078	781,324	1,914,403
SERVICES	0	5,15[illegible]	.21	0	0	.00	65,039	0	65,039
TOTAL NAVY FLEET-SF	0	198,180	7.93	0	154,797	15.89	2,502,721	1,347,943	3,850,664
NAVY FLEET&INDUST SUPPORT CTR-O&M									
HAZARDOUS WASTE	0	590	.02	0	590	.06	7,451	5,138	12,589
SPECIAL WEAPONS	0	9,500	.38	0	9 500	.98	119,971	82,727	202,698
TOTAL NAVY FLEET-O&M	0	10,090	.40	0	10 090	1.04	127,422	87,865	215,287
OTHER MISSIONS									
G&A REIMBURSABLE	0	27,484	1.10	0	0	.00	347,135	0	347,135
NAVY STOCK FUND ACTG	0	5,684	.23	0	0	.00	71,781	0	71,781
FINANCIAL SERVICES	0	427,534	17.11	0	0	.00	5,399,128	0	5,399,128
RETRO RPR SCREENING	0	0	.00	0	0	.00	0	0	0
PERSONAL PROPERTY	0	98,020	3.92	0	0	.00	1,237,846	0	1,237,846
OTH MISSION OPS	0	57,596	2.30	0	0	.00	727,347	0	727,347
PROCUREMENT	0	209,729	8.39	0	0	.00	2,648,570	0	2,648,570
REGIONAL CONTRACTING	0	0	.00	0	0	.00	0	0	0
TENANT SUPPORT	0	249,881	10.00	0	0	.00	3,155,628	0	3,155,628
TOTAL OTHER MISSIONS	0	1,075,933	43.06	0	0	.00	13,587,434	0	10,587,434
TOTAL ALL	0	2,498,810	100 00	0	971,986	100.00	31,556,276	8,481,581	40,037,857

FIGURE 1-1

DEPOT COST, MANPOWER AND WORKLOAD ANALYSIS REPORT
NAVY
OAKLAND NAVAL SUPPLY CENTER
DISTRIBUTION FUNCTIONS
PART II COSTS AND WORKLOAD
FISCAL YEAR 89

RUN DATE: 08/24/90
RUN TIME: 09.39.39

	LABOR			NON-LABOR		ALLOCATED	TOTAL	WORKLOAD
	CIV DIR	CIV IND	MILITARY	DIRECT	INDIRECT	COSTS	COSTS	
CONSOLIDATED FUNCTIONS-STOCK FUND								
RECEIPTS	3,625,393	0	0	203,657	0	4,976,133	8,805,184	418,660
UNIT COST-RCPTS	8.66	.00	.00	49	.00	11.89	21.03	
ISSUES	6,727,162	0	0	2,439,752	0	13,936,643	23,103,558	1,267,642
UNIT COST-ISSUES	5.31	.00	.00	1.92	.00	10.99	18.23	
TOT DLA DISTRIB	10,352,555	0	0	2,643,410	0	18,912,777	31,908,741	1,686,302
UNIT COST	6.14	.00	.00	1.57	.00	11.22	18.92	
OTHER CONSOLIDATED FUNCTIONS-O&M								
LOCAL DELIVERY	2,612,465	0	0	0	0	3,471,695	6,084,160	
TOT CONSOLID FUNCTS	12,965,021	0	0	2,643,410	0	22,384,472	37,992,902	
NAVY FLEET&INDUST SUPPORT CTR-SF								
FINANCIAL INV ACCTG	525,359	0	0	0	0	482,293	1,011,652	
INVENTORY MANAGEMENT	691,005	0	0	0	0	1,065,470	1,756,475	
TECHNICAL SERVICES	217,908	0	0	0	0	321,527	539,435	
OUTFITTING	1,121	0	0	0	0	1,334	2,455	
REPAIRABLE MGMT	1,516,472	0	0	22,800	0	1,914,403	3,453,675	
SERVMART	77,922	0	0	0	0	65,639	143,561	
TOTAL NAVY FLEET-SF	3,033,827	0	0	22,800	0	3,850,664	6,907,291	
NAVY FLEET&INDUST SUPPORT CTR-O&M								
HAZARDOUS WASTE	11,966	0	0	31,544	0	12,589	56,099	
SPECIAL WEAPONS	147,497	0	0	60,299	0	202,698	410,494	
TOTAL NAVY FLEET-O&M	159,463	0	0	91,843	0	215,287	466,592	
OTHER MISSIONS								
G&A REIMBURSABLE	2,480,513	0	0	0	0	347,135	2,827,648	
NAVY STOCK FUND ACTG	78,998	0	0	0	0	71,781	150,778	
FINANCIAL SERVICES	4,906,632	0	0	20,381	0	5,399,128	10,326,140	
RETRO RPR SCREENING	0	0	0	0	0	0	0	
PERSONAL PROPERTY	1,264,745	0	0	19,665	0	1,237,846	2,522,257	
OTH MISSION OPS	1,098,640	0	0	252,798	0	727,347	2,078,785	
PROCUREMENT	2,861,049	0	0	77,470	0	2,648,570	5,587,189	
REGIONAL CONTRACTING	0	0	0	0	0	0	0	
TENANT SUPPORT	0	0	0	0	0	3,155,628	3,155,628	
TOTAL OTHER MISSIONS	12,690,576	0	0	370,414	0	13,587,434	26,648,425	
TOTAL ALL	28,848,888	0	0	3,128,466	0	40,037,857	72,015,210	
REIMBURSEMENTS-INCLUDED ABOVE								
DISTRIBUTION	3,909,138	0	0	908,331	0	1,387,288	5,804,757	
NAVY FLEET-SF	1,370,724	0	0	-1,614	0	0	1,369,109	
NAVY FLEET-O&M	11,966	0	0	60,331	0	0	72,297	
G & A	0	0	0	0	0	2,480,513	2,480,513	
OTHER MISSIONS	1,056,678	0	0	143,926	0	0	1,200,304	
TOTAL REIMBURS	6,348,506	0	0	710,673	0	3,867,800	10,926,979	

FIGURE 4-2

Officials felt that it was not cost effective to determine whether the second line supervision should be allocated to issues or receipts. However, we feel that the costs of second line supervision could have been allocated based on the workload. For instance, at Oakland issues are 75% of the workload. We could therefore assume that 75% of the second line supervision should be allocated to issues. There would have been no additional costs involved in allocating second line supervision on this basis.

Subtracting indirect manhours from the issues will result in an overstatement of indirect costs allocated to receipts and an understatement of indirect costs allocated to issues. Additionally, most other functions (uniques) are treated in the same manner as receipts in regards to the allocation of indirect costs. Since the allocated costs are overstated for receipts and understated for issues, an individual may wish to discuss the aggregate total of the unit costs for receipts and issues and not discuss the unit cost of receipts or the unit cost of issues. It may be more prudent to discuss the "unit cost" at a particular activity and mean the unit cost of producing one unit of output and not one receipt or one issue.

In recent discussions with DMDC personnel, we were informed that beginning with fiscal year 1991 data, indirect costs will be allocated to the area where the costs were incurred. Data from time cards will be used to determine whether a supervisor was involved in processing receipts or

making issues. Individuals researching unit costs in the future should be aware that there will be difference in the treatment of indirect costs for pre-FY91 and post-FY90.

C. CLASSIFICATION OF G&A AND INDIRECT COSTS

One final remark concerning allocated costs is that individual line items in the financial records at each of the three sites researched did not match DMDC unit cost reports. The allocated G&A and indirect amounts differed among the reports but the sum of the these two costs did match DMDC reports. This may be due to differences between what DOD/DMDC and the services and DLA consider G&A and indirect costs. Since the total of these two costs is not different it appears as if all parties concerned agree on what is allocated or total allocated costs. In conversations with DOD and DMDC personnel we were informed that DOD is making a concentrated effort to resolve the semantics involved with unit cost terminology. Once the semantics have been worked out reconciling DMDC Unit Cost Reports and local records will become easier.

The remainder of this chapter will discuss the unit cost at each of the three sites under research.

D. OAKLAND UNIT COST

From Figure 4-2 we can see that Oakland's unit costs were $21.03 per receipt, $18.23 per issue and $18.92 per unit of

output. Table 4 provides a breakdown of the unit cost for each of these measures of output along with the percentage of each part of the unit cost to the total cost. Each of these cost categories will be discussed next.

Table 4

Oakland Unit Cost

	Total Costs	Unit Cost	Percent of Unit Cost
Receipts:			
Labor	$3,625,393	$8.66	41.17%
Non-labor	203,657	.49	2.31
Allocated	4,976,133	11.89	56.51
Total	$8,805,184	$21.03	100.00%
Issues:			
Labor	$6,727,162	$5.31	29.12%
Non-labor	2,439,752	1.92	10.56
Allocated	13,936,643	10.99	60.32
Total	$23,103,558	$18.23	100.00%
Total:			
Labor	$10,352,555	$6.14	32.44%
Non-labor	2,643,410	1.57	8.28
Allocated	18,912,777	11.22	59.27
Total	$31,908,741	$18.92	100.00%

1. DIRECT LABOR

The unit cost of direct labor between receipts ($8.66) and issues ($5.31) varies because receipts are much more labor intensive. In receipt processing, direct labor is expended identifying the material and ensuring the receipt documentation matches the material. Additionally, at Oakland

the Navy Integrated Storage and Retrieval System (NISTARS) aids in reducing the direct labor costs of both receipts and issues, but is much more effective in lowering issue direct labor costs. Dividing the direct labor costs by the productive manhours[18] used to produce the output gives Oakland an average labor wage rate of $15.54 per hour for receipts, $8.22 average per hour for issues and $9.84 average per hour for total work units. We did not investigate the cause of the difference in average labor wage rates between receipts and issues because this was not within the scope of this thesis. But it is a significant difference and should be researched in the future.

2. **NON-LABOR COSTS**

The unit cost of non-labor between receipts ($.49) and issues ($1.92) varies because the non-labor cost is primarily made up of supplies such as packing and shipping material. Issues require some degree of packaging whether the material is going to a local customer or an overseas customer.

3. **ALLOCATED COSTS**

The unit cost of the allocated costs is $11.89 for receipts and $10.99 for issues. Concerning the allocated portion (includes G&A and indirect costs) of unit costs at Oakland, from Table 4 we see that allocated costs make up

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[18]The productive manhour amounts come from the G&A Manhours-CIV column of the unit cost report Part I for Oakland which is Figure 4-1.

about 60% of the total unit costs whether we are talking about receipts, issues or total units. Compared to the other sites researched, we will see that this allocated cost is similar to Tracy and Sharpe.

The portion of G&A costs within the total allocated costs varies between receipts and issues. From Table 5 we can see that for receipts, G&A costs are 59% of total allocated costs, for issues the percentage is 74% and for total workload the percentage is 70%. One reason the percentages differ between receipts and issues may be due to the overstatement of indirect/overhead costs allocated to receipts. Since the indirect/overhead costs are greater for receipts, the G&A costs make up a smaller percentage of the total allocated costs.

TABLE 5

PERCENT OF ALLOCATED COSTS

	Total Costs (thousands)	Unit Cost	% of Total
Receipts:			
G&A	$2,945	$7.03	59%
Indirect	2,031	4.86	41
Total	$4,976	$11.89	100%
Issues:			
G&A	$10,338	$8.16	74%
Indirect	3,598	2.83	26
Total	$13,936	$10.99	100%
Totals:			
G&A	$13,284	$7.88	70%
Indirect	5,629	3.34	30
Total	$18,913	$11.22	100%

From Figure 4-1, the total number of productive manhours used at Oakland to perform 1,686,302 units of output was 1,214,608 hours. This total was used in the allocation of G&A costs. Also from Figure 4-1 we can see that 809,105 hours were used in the allocation of indirect/overhead costs. Previously we discussed that the difference between the manhours in the G&A column and the manhours in the indirect/overhead column was due to all indirect manhours being excluded from the allocation of overhead or indirect costs. The difference between these two manhour totals leads to the conclusion that Oakland used 405,503 manhours of indirect labor in producing 1,686,302 units of output. The percentage of indirect labor to total labor is 38.55%. Compared to the other two sites researched we will see that this percentage is quite high.

4. TREATMENT OF OTHER FUNCTIONS (NON-DISTRIBUTION)

Previously we mentioned that each of these supply depots perform other missions or uniques which are not subject to the unit cost computations. At Oakland these uniques fall under two categories, those missions that are considered to be within the realm of physical distribution and were transferred to DDRW and those missions that were not considered to be part of the physical distribution function and were not transferred to DDRW. The decision as to what would transfer to DDRW was agreed upon by DLA and NAVSUP.

The unique functions that were transferred to DDRW include repairables, hazardous material, radioactive material, and special weapons material. Material in each of these categories require greater care and are more labor intensive than other types of material when making issues or processing receipts. These functions were transferred to DDRW because they are physical distribution in nature (i.e., receipt, stow and issue).

Those unique functions of NSC Oakland which did not transfer to DDRW include the missions of the financial services, regional contracting, personal property and retrograde repairable screening departments or divisions. These functions are supervised and managed by personnel not attached to the physical distribution department.

The total amount of allocated costs at Oakland was $40,037,857 (includes G&A and indirect costs). Of this amount only $18,912,777 or 47.24% was allocated to the output measures of issues and receipts. The remaining amount was allocated to other missions or uniques. When compared to the other two sites this allocation percentage is extremely low. Additionally, 42% of the G&A costs at Oakland were allocated to the output measures while 66% of the overhead (indirect) costs were allocated to the output measures. In addition to the low percentage of indirect/overhead costs allocated to output measures, it was surprising to see that $3,155,628 or

7.88% of these costs was allocated to support of tenant commands.

E. TRACY UNIT COST

Figure 4-3 is the Part I, Manhour and Profile and G&A Allocation for Tracy for FY89. Figure 4-4 is the Part II, Costs and Workload for Tracy for FY89. From Figure 4-4 we can see that the unit cost for Tracy to process bin receipts was $15.89 per bin receipt, to process bulk receipts was $44.84 per bulk receipt, to make bin issues was $5.35 per bin issue, to make bulk issues was $34.59 per bulk issue and for total output was $16.21 per unit of output.

1. BIN AND BULK SUBCLASSIFICATIONS

The terms bin and bulk are used to describe the type of storage area required for an item. Bin items are normally small in nature. Examples of these types of items are circuit cards, nuts, bolts and screws. A large quantity of these type of items can be stored in one unique storage area such as a drawer, storage pan or similar small storage device.

Bulk items on the other hand require a larger storage area. Examples of bulk items are plate metal, tires, propellers or subsistence items.

DEPOT COST, MANPOWER AND WORKLOAD ANALYSIS REPORT
DLA
TRACY DEPOT
DISTRIBUTION FUNCTIONS
PART I MANHOUR PROFILE AND G & A ALLOCATION
FISCAL YEAR 89

RUN DATE: 08/02/90
RUN TIME: 14:42:02

	G&A MANHOURS MIL	G&A MANHOURS CIV	G&A MANHOURS %	OVERHEAD MANHOURS MIL	OVERHEAD MANHOURS CIV	OVERHEAD MANHOURS %	ALLOCATED G&A COSTS	ALLOCATED OE COSTS	ALLOCATED TOT COSTS
RECEIPTS - BIN	0	102,207	4 01	0	102,207	5 25	1,007,902	541,974	1,549,877
RECEIPTS - BULK	0	179,638	7.06	0	179,638	9 25	1,772,449	953,628	2,727,076
ISSUES - BIN	0	317,775	12 47	0	317,775	16 34	3,133,694	1,685,065	4,818,759
ISSUES- BULK	31,760	1,374,294	55.18	0	803,671	41 32	13,865,619	4,261,630	18,127,249
RCPTS & ISSUES	31,760	1,974,114	78.72	0	1,403 491	72 16	19,780,664	7,442,297	27,222,962
OTHER OUTPUTS-SF									
SET ASSEMBLY	0	15,156	.59	0	15,156	78	149,454	80 365	229,819
OCP OPERATIONS	0	4,539	.18	0	4,539	.23	44,758	24,068	68 826
DICOMSS	0	96,575	3 79	0	96,575	4.97	952,362	512,109	1,464,470
TRAY-PACK	0	120,637	4 73	0	120,637	6 20	1,189,644	639,701	1,829,345
CTR DIRECTED WORK	0	0	.00	0	0	.00	0	0	0
STAY IN SCHOOL	0	0	.00	0	0	00	0	0	0
STORAGE AIDS	0	0	.00	0	0	00	0	0	0
WORKAROUND	0	138,844	5 15	0	138,844	7.14	1,369,198	736,251	2,105,447
SUPPORT TO OTHERS	0	0	.00	0	0	.00	0	0	0
MAINTNCE (DDPV/DDOO)	0	0	00	0	0	.00	0	0	0
ALAMEDA	0	47,301	1.86	0	47,301	2 43	466,453	250 823	717,276
REIMBURSE FPP & M	0	118,433	4 65	0	118,433	6.09	1,167,915	628,017	1,795,932
HUMANITARIAN ASSIST	0	0	.00	0	0	00	0	0	0
DEPMEDS	0	0	.00	0	0	.00	0	0	0
EARTHQUAKE	0	0	.00	0	0	00	0	0	0
SHOE LAST	0	0	.00	0	0	.00	0	0	0
TOT OTH OUTPUTS-SF	0	541,485	21 25	0	541,485	27 84	5,339,781	2,871,333	8,211,115
OTHER OUTPUTS-O&M									
DOODS	0	0	.00	0	0	.00	0	0	0
CONUS COMM	0	0	00	0	0	00	0	0	0
TOT OTH OUTPUTS-O&M	0	0	.00	0	0	00	0	0	0
TOT DISTRIBUTION	31,760	2,515,599	99.98	0	1,944,976	100 00	25,120,445	10,313,631	35,434,076
OTHER MISSIONS									
G&A REIMBURSES	0	0	00	0	0	.00	0	0	0
DEFA	0	64	.00	0	0	.00	631	0	631
TENANTS	0	548	.02	0	0	00	5,402	0	5,402
2ND DEST TRANSP	0	0	.00	0	0	.00	0	0	0
PIKETON	0	0	.00	0	0	.00	0	0	0
TOT OTHER MISSION	0	612	.02	0	0	.00	6,033	0	6,033
TOTAL ACTIVITY	31,760	2,516,211	100.00	0	1,944,976	100 00	25,126,479	10,313,631	35,440,110

FIGURE 4-3

DEPOT COST MANPOWER AND WORKLOAD ANALYSIS REPORT
DLA
TRACY DEPOT
DISTRIBUTION FUNCTIONS
PART II COSTS AND WORKLOAD
FISCAL YEAR 89

RUN DATE. 08/02/90
RUN TIME 14 42 02

	LABOR			NON-LABOR	INDIRECT	ALLOCATED	TOTAL	WORKLOAD
	CIV DIR	CIV IND	MILITARY	DIRECT	COSTS	COSTS	COSTS	
RECEIPTS - BIN	1,021,799	254,920	0	18,301	0	1,549,877	2,844,887	179,082
UNIT COST - RCPT BIN	5.71	1.42	.00	.10	.00	8.65	15 89	
RECEIPTS - BULK	2,016,244	369,096	0	34,872	0	2,727,076	5,147,288	114,805
UNIT COST - RCPT BULK	17.56	3.21	.00	.30	.00	23 75	44 84	
ISSUES - BIN	3,259,485	1,008,596	0	648,473	0	4,818,759	9,735,314	1,819,765
UNIT COST - ISS BIN	1.79	.55	.00	.36	.00	2 65	5 35	
ISSUES- BULK	8,849,779	1,673,222	0	2,455,856	0	18,127,249	31,112 106	899,420
UNIT COST - ISS BULK	9 84	1 87	.00	2 73	.00	20.15	34 59	
RCPTS & ISSUES	15,147,297	3,311,834	0	3,157,502	0	27,222,962	48,839,595	3,013,072
UNIT COST - RCPT & ISS	5 03	1 10	.00	1 05	.00	9 03	16 21	
OTHER OUTPUTS-SF								
SET ASSEMBLY	0	192,344	0	7,221	0	229 819	429,384	
CCP OPERATIONS	57,814	0	0	0	0	68,826	126 640	
DICOMSS	921,017	356,353	0	24,841	0	1,464,470	2,766 681	
TRAY-PACK	0	1,244,998	0	0	0	1,829,345	3,074,343	
CTR DIRECTED WORK	0	0	0	0	0	0	0	
STAY IN SCHOOL	0	0	0	89,408	0	0	89,408	
STORAGE AIDS	0	0	0	1,598 302	0	0	1,598 302	
WORKAROUND	0	1,618,512	0	343,515	0	2,105,447	4,066,774	
SUPPORT TO OTHERS	0	0	0	0	0	0	0	
MAINTNCE (DDRV/DDOO)	0	0	0	0	0	0	0	
ALAMEDA	0	694 345	0	0	0	717,276	1,401,643	
REIMBURSE FFF & M	950,817	44 ,448	0	420,903	0	1,795,932	3,613,106	
HUMANITARIAN ASSIST	0	0	0	0	0	0	0	
DEEMDS	0	0	0	0	0	0	0	
EARTHQUAKE	0	0	0	0	0	0	0	
SHOE LAST	0	0	0	0	0	0	0	
TOT OTH OUTPUTS-SF	1,929,642	4,547,023	0	2,484,501	0	8,211,115	17,165,287	
OTHER OUTPUTS-O&M								
DODDS	0	0	0	0	0	0	0	
CONUS COOP	0	0	0	0	0	0	0	
TOT OTH OUTPUTS-O&M	0	0	0	0	0	0	0	
TOT DISTRIBUTION	17,076,946	7,858,856	0	5,642,003	0	35,434,076	66 004,882	
OTHER MISSIONS								
G&A REIMBURSES	0	0	0	807,848	0	0	807,848	
DERA	0	919	0	1,811,441	0	631	1,812 991	
TENANTS	0	6,003	0	41	0	5,402	11 446	
2ND DEST TRANSP	0	0	0	13,530,595	0	0	13,530,595	
PIKETON	0	0	0	0	0	0	0	
TOT OTHER MISSION	0	6,922	0	16,149,925	0	6,033	16,162,880	
TOTAL ACTIVITY	17,076,946	7,858,778	0	21,791,928	0	35,440,110	82,167,762	
REIMBURSEMENTS-INCLUDED ABOVE								
DISTRIBUTION-SF	0	0	0	6,754,302	0	0	6,754,302	
G&A REIMB	0	0	0	807,848	0	0	807,848	
DISTRIBUTION-O&M	0	0	0	0	0	0	0	
OTHER MISSION	0	0	0	0	0	0	0	
TOTAL REIMB	0	0	0	7,562,150	0	0	7,562,150	

FIGURE 4-4

In talking to personnel at Tracy it became apparent that there is not a fine line between bin and bulk items. The extremes of each type of item are easy to classify but there are numerous items which may be classified as bin by one manager and bulk by another. Though all three sites researched classify bin and bulk items, Tracy is the only site for which DMDC has captured cost data according to bin and bulk classification. This narrative was provided as an explanation of the terms bin and bulk but for the remainder of this section we will combine the totals for bin and bulk issues and receipts and will only refer to issues or receipts.

Table 6 provides a breakdown of the unit cost for each of these measures of output along with the percentage of each part of the unit cost to the total cost.

Table 6

Tracy Unit Cost

	Total Costs	Unit Cost	Percent of Unit Cost
Receipts:			
Labor	$3,662,049	$12.46	45.83%
Non-labor	53,173	.18	.66
Allocated	4,276,953	14.55	53.51
Total	$7,992,175	$27.19	100.00%
Issues:			
Labor	$14,797,082	$5.44	36.24%
Non-labor	3,104,329	1.14	7.60
Allocated	22,946,008	8.43	56.16
Total	$40,847,420	$15.01	100.00%
Total:			
Labor	$18,459,131	$6.13	37.82%
Non-labor	3,157,502	1.05	6.48
Allocated	27,222,962	9.03	55.70
Total	$48,839,595	$16.21	100.00%

2. DIRECT LABOR

Just as in the analysis of Oakland the unit cost of direct labor between receipts ($12.46) and issues ($5.44) varies because receipts are much more labor intensive. At Tracy the Defense Logistics Agency Warehousing and Shipping Procedures (DWASP) aids in reducing the labor costs of both receipts and issues, but is the much more effective in lowering issue labor costs. Dividing the direct labor costs by the productive manhours used to produce the output gives Tracy a labor wage rate of $10.77 per hour for receipts, $7.16 per hour for issues and $7.67 per hour for total work units. These labor wage rates per hour are substantially lower than the

labor wage rates at Oakland. Nothing in our research leads us to any conclusion regarding this difference.

3. NON-LABOR COSTS

As in the case of Oakland we can see that the non-labor unit costs at Tracy are higher for issues ($1.14) than for receipts ($.18) for the same reason as provided in the Oakland discussion, issues require more packaging/packing materials than do receipts.

4. ALLOCATED COSTS

As seen in Table 6 the percentage of allocated costs to total costs is approximately 56%, which is lower than Oakland's 60%.

From Table 7 we can see that the portion of G&A costs to total allocated costs varies between receipts and issues. For receipts G&A costs are 65% of total costs, for issues the percentage is 74% and for total workload the percentage is 73%. This reflects a similar percentage breakdown as found for Oakland in Table 5.

TABLE 7

PERCENT OF ALLOCATED COSTS

	Total Costs (thousands)	Unit Cost	% of Total
Receipts:			
G&A	$2,781	$9.46	65%
Indirect	1,496	5.09	35
Total	$4,277	$14.55	100%
Issues:			
G&A	$16,999	$6.25	74%
Indirect	5,947	2.18	26
Total	$22,946	$8.43	100%
Totals:			
G&A	$19,780	$6.56	71%
Indirect	7,443	2.47	29
Total	$27,223	$9.03	100%

From Figure 4-3, the total number of productive manhours used at Tracy to perform 3,103,072 units of output was 1,974,114 of civilian hours and 31,760 military hours. This amount was used in the allocation of G&A costs. Also from Figure 4-3 we can see that 1,403,491 hours were used in the allocation of indirect costs. This difference is similar to the one that was discussed in the Oakland section. Additionally, in the case of Tracy military productive manhours were not included when computing the allocation of indirect costs. The difference between these two manhour figures leads to the conclusion that Tracy used 570,623 manhours of indirect labor in producing 3,013,072 units of output. The percentage of indirect labor to total labor is 28.90%. This percentage is lower than the percentage of

indirect labor at Oakland but higher than the percentage at Sharpe.

5. TREATMENT OF OTHER FUNCTIONS

The unique functions at Tracy include the receipt, storage and issue of subsistence items, steel, lumber, cable/wire and medical items. Unlike Oakland, all of the unique functions at Tracy were transferred under DDRW control and remain uniques.

The total allocated costs at Tracy was $35,440,110 of which $27,222,962 or 76.81% was allocated to the output measures of receipts and issues. This is significantly higher than the 47.24% allocated at Oakland to receipts and issues. Unlike Oakland, Tracy does not provide significant services to other activities and therefore we see that most of the G&A and indirect/overhead costs are allocated to the output measures.

F. SHARPE UNIT COST

Figure 4-5 is the Part I, Manhour and Profile and G&A Allocation for Sharpe for FY89. Figures 4-6 and 4-7 are the Part II, Costs and Workload for Sharpe for FY89. From Figure 4-6 we can see that the unit costs for Sharpe were $65.73 per receipt, $38.67 per issue and $42.91 per unit of output. Table 8 provides a breakdown of the unit cost for each of these measures of output along with the percentage of each part of the unit cost to the total cost.

TABLE 8

Sharpe Unit Cost

	Total Costs	Unit Cost	% of Unit Cost
Receipts:			
Labor	$3,297,133	$23.79	36.19%
Non-labor	68,668	.50	.76
Overhead	5,744,509	41.44	63.05
Total	$9,110,310	$65.73	100.00%
Issues:			
Labor	$9,209,207	$12.33	31.89%
Non-labor	3,576,126	4.79	12.39
Overhead	16,082,277	21.55	55.72
Total	$28,867,610	$38.67	100.00%
Total:			
Labor	$12,506,340	$14.13	32.93%
Non-labor	3,644,794	4.12	9.60
Overhead	21,826,786	24.66	57.47
Total	$37,977,920	$42 91	100.00%

1. **DIRECT LABOR**

As with Oakland and Tracy, the unit cost of labor between receipts ($23.79) and issues ($12.33) varies because receipts are much more labor intensive. At Sharpe, the Army Standard Depot System (SDS) with the Area Oriented Depot (AOD) modification aids in reducing the labor costs of both receipts and issues, but is the much more effective in lowering issue labor costs.

Sharpe is the only activity of the three sites researched for which DMDC has included military labor costs when computing unit costs. It should be noted that military labor costs were $.04 per unit and this equates to approximately .1%

or less of the total unit cost of receipts, issues or total output. Therefore, military labor costs are not a significant portion of the unit cost and not likely to be in the future.

Dividing the direct labor costs by the productive manhours used to produce the output gives Sharpe a wage labor rate of $15.55 per hour for receipts, $13.36 per hour for issues and $13.88 per hour for total work units.

The direct labor cost amount at Sharpe is significantly higher than at both Oakland and Tracy. A portion of this is due to the fact that Sharpe's main distribution building known as the WDF currently lacks a sophisticated computer software system to enhance the output of the workers. Table 9 shows the workload per hour at Oakland, Tracy and Sharpe. This "inefficiency" coupled with the higher labor wage rate at Sharpe results in the direct labor costs being much greater at Sharpe than at Oakland or Tracy. These workload per hour figures were derived by dividing the workload per output measure reported on Part II of the unit cost reports by the productive manhours for each output measure as reported on Part I of the unit cost reports.

DEPOT COST, MANPOWER AND WORKLOAD ANALYSIS REPORT
ARMY
SHAPPE ARMY DEPOT
DISTRIBUTION FUNCTIONS
PART I MANHOURS
FISCAL YEAR 89

RUN DATE: 10/01/89
RUN TIME: 10.22 56

	G&A MANHOURS			OVERHEAD MANHOURS			ALLOCATED		ALLOCATED	ALLOCATED
	MIL	CIV	%	MIL	CIV	%	ISC COSTS	G&A COSTS	OH COSTS	TOT COSTS
***STOCK FUND-SECONDARY ITEM MGMT										
*PRIMARY MEASURE										
RECEIPTS	331	211,677	12 97	331	211 677	22 17	57,925	2,989,897	845,838	3,893,659
ISSUES	2,660	686,841	42 19	1 997	594,468	62 36	188,385	8,413,264	2,379,686	10,981,335
TOT SEC RECPT & ISS	2,991	898,518	55 17	2,328	806,145	84 52	246,309	11,403,161	3,225,524	14,874,994
*OTHER OUTPUT MEASURES										
COSIS INSPECTION	100	21 787	1 34	100	21,787	2 29	5,980	309,149	87,321	402,450
COSIS OPERATIONS	0	17 450	1 07	0	17,450	1 82	4,768	247,716	69,619	322,103
TOTAL COSIS	100	39,237	2 41	100	39,237	4 11	10,748	556,865	156,941	724,553
*OTHER OUTPUTS NOT MEASURED										
CCP OPERATIONS	0	0	00	0	0	00	0	2,121,144	0	2,121,144
SET ASSEMBLY	0	370	02	0	370	04	101	5,349	1,476	6,926
ADD/MOD	13	64,890	3 97	13	64,890	6 79	17,733	0	258 940	276,673
TOT OTH OUT-NOT MEAS	13	65,260	3 99	13	65,260	6 82	17,834	2,126,493	260,416	2,404,743
TOTAL SP-SEC ITEMS	3,104	1,003,015	61 57	2 441	910,642	95 46	274,891	14,086,519	3,642,881	18,004,291
***OMA-MAJOR END ITEM MGMT & AMMUNITION										
**MAJOR END ITEMS										
*PRIMARY MEASURE										
RECEIPTS	0	0	00	0	0	.00	0	0	0	0
ISSUES	0	0	00	0	0	00	0	0	0	0
TOT MAJ RECPT & ISS	0	0	.00	0	0	00	0	0	0	0
*OTHER OUTPUT MEASURES										
COSIS INSPECTION	0	0	.00	0	0	.00	0	0	0	0
COSIS OPERATIONS	0	0	.00	0	0	00	0	0	0	0
COSIS EXERCISING	0	6,536	.40	0	6,536	.68	1,786	92,143	26,076	120,005
TOTAL MAJ COSIS	0	6,536	40	0	6,536	.68	1,786	92,143	26,076	120,005
*OTHER OUTPUTS NOT MEASURED										
UMMIP	0	36,568	2 24	0	36,568	3 82	9,991	514,956	145,894	670,841
TECH ASSISTANCE	0	305	.02	0	305	.03	83	4,207	1,217	5,507
TOT OTH OUT-NOT MEAS	0	36,873	2 26	0	36 873	3.86	10,074	519,163	147,110	676,348
TOT MAJOR END ITEMS	0	43,409	2 66	0	43,409	4.54	11,860	611,306	173,187	796,353
TOTAL SEC&MAJ ITEMS	3,104	1,046,424	64 23	2 441	954,051	100 00	286,751	14,697,825	3,816,068	18,800,644
**AMMUNITION										
*PRIMARY MEASURE										
RECEIPTS	0	0	00	0	0	.00	0	0	0	0
ISSUES	0	0	.00	0	0	00	0	0	0	0
TOT AMMO RECPT & ISS	0	0	.00	0	0	.00	0	0	0	0
*OTHER OUTPUT MEASURES										
COSIS INSPECTION	0	0	00	0	0	00	0	0	0	0
COSIS OPERATIONS	0	0	00	0	0	.00	0	0	0	0
TOTAL AMMO COSIS	0	0	00	0	0	.00	0	0	0	0
*OTHER OUTPUTS NOT MEASURED										
SET ASSEMBLY	0	0	00	0	0	.00	0	0	0	0
TECH ASSISTANCE	0	0	.00	0	0	00	0	0	0	0
CHEMICAL	0	0	00	0	0	.00	0	0	0	0
SPECIAL WEAPONS	0	0	.00	0	0	00	0	0	0	0
RAD/CHEM WASTE DISP	0	0	.00	0	0	.00	0	0	0	0
TOT OTH OUT-NOT MEAS	0	0	.00	0	0	.00	0	0	0	0
TOTAL AMMUNITION	0	0	00	0	0	00	0	0	0	0
TOT OMA-MAJ & AMMO	0	43,409	2 66	0	43,409	.00	11,860	611,306	173,187	796,353
***OTHER MISSIONS										
HOUSEHOLD GOODS	186	8,793	.55	0	0	.00	2,453	126,852	0	129,305
DEPOT MAINTENANCE	0	0	.00	0	0	.00	0	0	0	0
MAOF TENANT SUPPORT	0	0	.00	0	0	.00	0	0	0	0
MISC OTHER	32,107	543,515	35 23	0	0	00	157,271	383,575	0	540,846
TOT OTH MISSION	32,293	552,308	35 77	0	0	00	159,724	510,427	0	670,151
TOT ACTIVITY	35,397	1,598,732	100 00	2 441	954 051	00	446,475	15,208,252	3,816,068	19,470,795

FIGURE 4-5

DEPOT COST, MANPOWER AND WORKLOAD ANALYSIS REPORT
ARMY
SHARPE ARMY DEPOT
DISTRIBUTION FUNCTIONS
PART II COSTS AND WORKLOAD
FISCAL YEAR 89

RUN DATE: 10/01/90
RUN TIME: 10 22.56

	LABOR			NON-LABOR	INDIRECT	ALLOCATED	TOTAL	WORKLOAD
	CIV DIR	CIV IND	MILITARY	DIRECT	COSTS	COSTS	COSTS	
***STOCK FUND-SECONDARY ITEM MGMT								
*PRIMARY MEASURE								
RECEIPTS	3,291,788	0	5,345	68 668	1,850,850	3,893,659	9,110,310	138,597
UNIT COST-RECPTS	23.75	.00	.04	50	13.35	28.09	65.73	
ISSUES	9,176,829	0	32,378	3 576 126	5,100,942	10,981,335	28,867,610	746,499
UNIT COST-ISSUES	12.29	00	.04	4 79	6.83	14 71	38.67	
TOT SEC RECPT & ISS	12,468,617	0	37,723	3 644 791	6,951,792	14,874,994	37,977,920	885,096
UNIT COST-SF	14.09	00	04	4 12	7 85	16 81	42 91	
*OTHER OUTPUT MEASURES								
COSIS INSPECTION	397,189	0	1 622	780	329,358	402,450	1,131,399	13,905
UNIT COST-COSIS INSP	28 56	.00	17	06	23 69	28 94	81.37	
COSIS OPERATIONS	302,130	0	0	75 351	199,890	322,103	899,474	3,588
UNIT COST-COSIS OPS	84 21	.00	00	21 00	55 71	89 77	250 69	
TOTAL COSIS	699,319	0	1 622	76 131	529,248	724,553	2,030,873	17,493
UNIT COST-COSIS	39 98	00	09	4 35	30 25	41 42	116 10	
*OTHER OUTPUTS NOT MEASURED								
CCP OPERATIONS	0	0	0	3,615,381	1,237,127	2,121,144	6,973,652	
SET ASSEMBLY	5,430	0	0	0	2,927	6,926	15,283	
AOD/MOD	1,269,078	0	208	1 091 891	0	276,673	2,637,850	
TOT OTH OUT-NOT MEAS	1,274,508	0	208	4,707,272	1,240,054	2,404,743	9,626,785	
TOTAL SF-SEC ITEMS	14,442,444	0	39 553	8 478,197	8,721,094	18,004,291	49,635,579	
***OMA-MAJOR END ITEM MGMT & AMMUNITION								
**MAJOR END ITEMS								
*PRIMARY MEASURE								
RECEIPTS	0	0	0	0	0	0	0	
UNIT COST-RECPTS	.00	00	.00	00	.00	.00	.00	
ISSUES	0	0	0	773,266	0	0	773,266	
UNIT COST-ISSUES	00	00	00	00	00	.00	00	
TOT MAJ RECPT & ISS	0	0	0	773,266	0	0	773,266	
UNIT COST-MAJ ITEMS	00	.00	00	00	.00	.00	.00	
*OTHER OUTPUT MEASURES								
COSIS INSPECTION	0	0	0	0	0	0	0	
UNIT COST-COSIS INSP	.00	00	00	00	00	.00	00	
COSIS OPERATIONS	0	0	0	0	0	0	0	
UNIT COST-COSIS OPS	.00	.00	00	00	00	.00	.00	
COSIS EXERCISING	112,297	0	0	160,436	55,209	120,005	447,947	
UNIT COST-COSIS EXER	.00	00	00	00	00	.00	.00	
TOTAL MAJ COSIS	112,297	0	0	160 436	55,209	120,005	447,947	
UNIT COST-COSIS MAJ	.00	00	00	00	00	.00	.00	
*OTHER OUTPUTS NOT MEASURED								
UMFP	623,200	0	0	421,356	269,806	670,841	1,988,203	
TECH ASSISTANCE	5,063	0	0	1,278	2,878	5,507	14,726	
TOT OTH OUT-NOT MEAS	628,263	0	0	175,634	272,684	676,348	2,002,929	
TOT MAJOR END ITEMS	740,560	0	0	1,359 336	327,893	796,353	3,224,142	
TOTAL SEC&MAJ ITEMS	15,183,004	0	39 553	9,787 533	9,048,987	18,800,644	52,859,721	

FIGURE 4-6

DEPOT COST, MANPOWER AND WORKLOAD ANALYSIS REPORT
ARMY
SHARPE ARMY DEPOT
DISTRIBUTION FUNCTIONS
PART II COSTS AND WORKLOAD
FISCAL YEAR 89

RUN DATE: 10/01/90
RUN TIME: 10 22.56

	LABOR			NON-LABOR	INDIRECT	ALLOCATED	TOTAL	WORKLOAD
	CIV DIR	CIV IND	MILITARY	DIRECT	COSTS	COSTS	COSTS	
**AMMUNITION								
*PRIMARY MEASURE								
RECEIPTS	0	0	0	0	0	0	0	
UNIT COST-ISSUES	00	.00	00	00	.00	00	.00	
ISSUES	0	0	0	0	0	0	0	
UNIT COST-AMMO	00	.00	00	00	.00	00	.00	
TOT AMMO RECPT & ISS	0	0	0	0	0	0	0	
UNIT COST-COSIS INSP	.00	.00	00	00	.00	.00	00	
*OTHER OUTPUT MEASURES								
COSIS INSPECTION	0	0	0	0	0	0	0	
UNIT COST-COSIS OPS	00	00	00	00	00	.00	00	
COSIS OPERATIONS	0	0	0	0	0	0	0	
UNIT COST-COSIS AMM	.00	00	00	00	.00	00	.00	
TOTAL AMMO COSIS	0	0	0	0	0	0	0	
	00	00	00	00	.00	.00	00	
*OTHER OUTPUTS NOT MEASURED								
SET ASSEMBLY	0	0	0	0	0	0	0	
TECH ASSISTANCE	0	0	0	0	0	0	0	
CHEMICAL	0	0	0	0	0	0	0	
SPECIAL WEAPONS	0	0	0	0	0	0	0	
RAD/CHEM WASTE DISP	0	0	0	0	0	0	0	
TOT OTH OUT-NOT MEAS	0	0	0	0	0	0	0	
TOTAL AMMUNITION	0	0	0	0	0	0	0	
TOT OMA-MAJ & AMMO	740,560	0	0	1,359,336	327,893	796,353	3,224,142	
***OTHER MISSIONS								
HOUSEHOLD GOODS	118,457	0	3,063	73	79,043	129,305	329,941	
DEPOT MAINTENANCE	0	0	0	0	0	0	0	
MAOF TENANT SUPPORT	0	0	0	512 089	0	0	512,089	
MISC OTHER	9,370,268	0	687,257	14,546 905	2,145	540,846	25,147,421	
TOT OTH MISSION	9,488,725	0	690 370	15,059,067	81,188	670,151	25,989,451	
TOT ACTIVITY	24,671,729	0	729,873	24,846,600	9,130,175	19,470,795	78,849,172	

*** LABOR AND NON-LABOR INDIRECT COSTS ARE BOTH INCLUDED UNDER THE 'INDIRECT COSTS' COLUMN

FIGURE 4-7

TABLE 9

WORKLOAD PER HOUR COMPARISON

Activity	Receipts/Hr	Issues/Hr	Workload/Hr
Oakland	1.80	1.55	1.60
Tracy	1.04	1.61	1.53
Sharpe	.65	1.08	.98

2. **NON-LABOR COSTS**

As at Oakland and Tracy, the unit cost for non-labor costs varies between receipts ($.50) and issues ($4.79) because issues require more packaging/packing supplies. It should be noted that Sharpe's non-labor costs are triple those at Oakland and Tracy for issues.

3. **ALLOCATED COSTS**

The allocated portion of unit costs at Sharpe makes up approximately 57% of the total unit cost. This percentage is slightly less than the 60% witnessed at Oakland and similar to the percentage found at Tracy.

As mentioned in Chapter III, Sharpe was previously funded under the Industrial Fund concept. Their allocated costs were forced into the unit cost report generated by DMDC because DMDC was unable to break out the G&A and indirect/overhead costs from the financial records provided by the Army. Indirect costs and G&A costs were not allocated by DMDC, but rather were input directly into the report from information

provided by DESCOM. For example, the G&A manhours for receipts were 12.97% of the total manhours yet receipts were assigned 20% of the G&A costs.

Also, some indirect costs are not included on Part I of the Sharpe unit cost report and there is an additional column on Sharpe's Part II (Figure 4-6) labeled "Indirect Costs". We could not determine which indirect or overhead cost codes were included in Part I and which cost code dollar amounts were reported directly on Part II.

Additionally, on Figure 4-5 note the column titled "Allocated ISC Costs." These costs are costs allocated to Sharpe from the Army's Information System Command. This is the only case for the three supply depots researched for which a headquarters command allocated some type of headquarters' overhead costs to the depot. These "ISC" costs were allocated to receipts, etc. by the percentage of G&A manhours to total manhours.

From Figure 4-5, the total number of productive manhours used at Sharpe to perform 885,096 of output consisted of 1,003,015 civilian hours and 3,104 military hours. Also from Figure 4-5 we can see that 910,642 civilian hours and 2,441 military hours would have been used to allocate overhead or indirect costs if DMDC had been able to allocate these costs. Previously we discussed that this difference was due to all indirect manhours being excluded from the allocation of overhead or indirect costs. The difference between these two

manhour figures leads to the conclusion that Sharpe used 93,036 manhours of indirect labor in producing 885,096 units of output. The percentage of indirect labor to total labor is 9.25%. This percentage is significantly lower than the percentage of indirect labor at Oakland (38.55%) and Tracy (28.9%).

4. TREATMENT OF OTHER FUNCTIONS

The unique functions at Sharpe include the receipt, storage and issue of tires, managing a household goods department, and care of supplies in storage (COSIS). Care of supplies in storage is the maintenance of items such as engines and pumps. Lubrication and testing of these stored items is required to ensure that they will function properly when requisitioned by the end user. On Figure 4-6 the reader can see that a unit cost has been generated for COSIS operations. In discussions with DMDC and DOD personnel this unit cost will not be used in resourcing COSIS operations at Sharpe. As in the case of Tracy, all of the unique functions at Sharpe remain under DDRW control.

The total allocated costs at Sharpe were $28,600,970 of which $21,826,786 or 76.31% was allocated to the output measures of receipts and issues. This is significantly higher than the 47.24% allocated at Oakland to receipts and issues and approximately the same as the 76.81% allocated at Tracy. Sharpe is similar to Oakland in that it performs services for

other activities or missions. We expected to find t' percentage of G&A and indirect costs allocated to the output measures (receipts and issues) closely resemble that found at Oakland. However, as shown above this percentage more closely mirrors Tracy rather than Oakland. It appears as if the "inefficiency" at Sharpe causes more manhours to be assigned to the output measures. Since manhours are used to allocate G&A and indirect/overhead costs, the output measures may bear a higher share of these costs than you would otherwise expect. Thus, costs allocated to other missions may be understated.

G. UNIQUES-OTHER FUNCTIONS

In Chapter III we discussed that once implemented, unit cost data will be used by DOD managers to reduce the cost of doing business, improve operations, measure improvements, evaluate and support budgets, and make decisions. We have discussed that managers at DDRW are faced with missions which are subject to unit costing and those which are not subject to unit costing. Table 10 shows what percentage of the three sites total costs are unit costs and the percentage of total costs which are not.

Table 10

Unit and Unique Costs

	Total Costs	Unit Costs (%)	Unique Costs (%)
Oakland	$72.0M	$31.9M (44)	$40.1M (56)
Tracy	$82.1M	$48.8M (59)	$33.3M (41)
Sharpe	$78.8M	$37.9M (48)	$40.9M (52)

Managers at all levels need to be aware of what portion of the total costs of an activity falls under unit costing. The dollar amount and percentage of unique costs shown in Table 10 is quite significant. Managers will have to use means other than unit costing or variations of unit costing to identify potential savings in the unique cost areas.

During personal interviews at each of the three sites it was noted that some managers have the ability to charge labor costs to either unit cost areas or other areas. We did not investigate this area, but the fact that unit cost data can be manipulated at the source document level[19] may cause someone to question the accuracy of either the unit cost totals or the unique cost totals. Therefore, not only direct labor will be misstated but costs allocated on the basis of direct labor data will also be misstated.

In the future uniques should become reimbursables with a "customer" paying for the services/products they receive. A

[19]Recall that labor costs and appropriate cost codes are documented on time cards.

customer of uniques can reasonably be expected to ask "What am I paying for?" Unit costing will enable the provider of the uniques to show the customer what they are paying for since uniques will bear their share of the G&A and indirect costs of the activity. The customer can then negotiate from an informed position and the contracts will be based on more realistic rates.

H. COMPARISONS AND RECOMMENDATIONS

The previous three sections provided information on how the G&A and indirect costs were allocated at each of the three sites and examined the makeup of the unit cost at each site. There are differences as to how these costs were allocated. At Oakland and Tracy these costs were allocated based on productive manhours. At Sharpe these costs were allocated by DESCOM by some other means based on the Army's Industrial Fund accounting system. We were unable to find out how these costs were allocated. We observed the unit costs at Sharpe to be extraordinarily high compared to Oakland and Tracy. Our research also found that the average wage rate per hour for receipts is greater than for issues and that Sharpe's average wage rate per hour is greater than the rates observed at Oakland and Tracy. Additionally, we discovered that the receipts and issues per productive manhour are significantly greater at Oakland and Tracy in comparison to Sharpe.

Beginning with fiscal year 1991 each of the three researched sites will be using the DLA accounting system. Each will be using the same cost codes to account for the same functions. The exception to this rule will be that each activity will still be performing unique functions, but the primary output measures will be accounted for in the same way. Additionally, G&A and indirect costs will use the same cost codes at each site.

For fiscal year 1989, since the overhead (indirect) costs are understated for issues and overstated for receipts we feel that it is best to focus on the total unit cost at a supply depot. Total unit cost is the aggregate of the receipt and issue costs and workload. As mentioned earlier in this chapter beginning with fiscal year 1991, this under and overstatement of overhead (indirect) costs will not occur.

Productive manhours are the key to how G&A and overhead costs are allocated. We did not research this area, but there may be a better way to allocate some of these costs. Utility and janitorial costs could be allocated on the basis of square feet. The cost to allocate different G&A and overhead based on different denominators may exceed the benefit provided the manager. Allocating G&A and overhead costs based on productive manhours is easily done by DMDC. Attempting to provide a more "correct" allocation may not be cost effective.

I. FINAL COMMENTS

Though our research effort primarily dealt with analyzing the allocation of G&A and indirect costs, we would be remiss if we did not provide comments on the entire DOD unit cost system. The concept behind the unit cost system is to motivate managers and workers to become aware of costs and to highlight the cost factor in management decisions.

Under bottom line budgeting getting the job done was the primary effort with the question "What does/did it cost?" seldom being answered if in fact the question was even asked. From our perspective, unit costing has changed that attitude. In every interview with managers at the three sites, the concern for "low unit costs" was voiced repeatedly and the managers were talking about FY89 dollars which had already been spent!

Our research did not include discussions with lower level depot personnel making the receipts and issues. However, we are confident that this concern for lower unit costs has trickled down to the shop floor from the managers' offices. Evidence of this employee awareness of costs is provided by those activities which have implemented some form of employee gainsharing such as the Defense Depot, Mechanicsburg, PA and the Naval Aviation Depot, Cherry Point, NC.

Lowering unit costs at the expense of "quality" should not be accepted by managers. Standards for service[20] should not be randomly decreased to allow lower unit costs. Unit costing should not impair the non-financial measures of performance for quality, service and timeliness. If standards need to be lowered it should be done selectively with impact to the customer as the primary concern and not lower costs. Everyday we see American companies say that they can and do produce a high quality product at a low price and we feel that this can also be accomplished at supply depots and other activities which will be resourced by the unit cost method. Unit costing should induce managers to become resourceful and to identify inefficiencies in the work process. Reducing inefficiencies will free up resources to be used to improve quality.

In this era of declining resources unit costing has given managers another management tool besides the "meat axe" approach to reducing costs. By analyzing the total unit cost and its components[21] managers should be able to make more intelligent decisions when faced with reduced resources and selectively decide where to place these resources.

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[20]Such as receipts and issues processed on time, warehouse refusals and inventory accuracy.

[21]Direct and indirect labor, direct and indirect material, G&A and other indirect or overhead costs.

We are amazed at the speed with which unit costing has been both developed and implemented within DOD. In less than a year unit costs went from being a concept to being implemented at supply depots with other functions soon to follow. For an organization which has received criticism for being bureaucratic and reluctant to change, especially in the acquisition area, DOD's rapid implementation is noteworthy. Additionally, the true beauty of the unit cost system is that the implementation of unit costing appears to be relatively inexpensive. The development of this system did not involve millions of dollars of consultants fees for study and design of the system.

The primary management tool, the unit cost report, is created by DMDC from data which already exists. With the exception of the manhours spent by DMDC writing programs to convert the raw financial data into the reports and the conferences which have been held to discuss and decide the output measures and uniques of each of the functions to be unit costed the cost has been minimal. We have been told that DMDC expects to add approximately 20 people to maintain and run the unit cost system. We feel that the benefits to DOD managers derived from this management tool will far exceed both the costs incurred to date and future operation and maintenance of the unit costs system.

Throughout this thesis we have repeatedly stated that unit costing in itself will not reduce costs or result in

savings. An example of this comes from our analysis of the unit cost at Sharpe. At Sharpe we saw that the workload per hour was significantly inefficient when compared to Oakland and Tracy. Now that the unit cost reports have brought this fact to the attention of the DDRW and Sharpe site managers actions should be taken to improve the efficiency of the Sharpe site. The first action is already in progress and that is to acquire a software program to run the WDF. We are confident that managers will find other actions to take to improve the efficiency of Sharpe which will result in reduced costs and increased savings. Therefore, it is the response that managers take to the information provided by the unit cost system that will result in savings.

By no means do we profess that the unit cost system is the panacea to reducing all expenditures at supply depots and the other functions to be unit costed. But it is a giant step in the right direction. Unit costing will provide managers a standardized metric in their analysis of the "cost of doing business." Managers are still free to implement planning and control systems for their local activities and operations that help them meet the desired goals and objectives.

In Chapter V we will provide a summary of this research project as well as identifying possible future research areas related to this thesis.

V. SUMMARY AND FUTURE RESEARCH AREAS

A. SUMMARY

Chapter I provided a brief discussion of the major issue of why DOD must reduce expenditures and several alternative methods of reducing expenditures. The concept of resourcing or budgeting by unit costs was introduced by DOD as a means to motivate managers to analyze the processes of their activity and to eliminate inefficiencies. Specifically, we focused our research attention on the area of unit cost's allocation of G&A and overhead costs at three physical distribution activities.

In Chapter II we presented the background and historical information on both unit costs and the three research sites. We briefly mentioned the Defense Management Review and its impact on unit costs and the consolidation of physical distribution activities.

A presentation of the methods by which we collected material for this research paper was provided in Chapter III. Since the concept of unit costs is relatively new to DOD we were limited to doing field research to collect data and information. Personal interviews and review of DOD guidelines were our primary sources of gathering material. Additionally, we provided the definitions which will be used in the DOD unit

cost system. This chapter included sections on the primary outputs (line items issued and line items received) as well as the costs (direct, indirect, G&A) to be used in this system. The role of the Defense Manpower Data Center in the unit cost system was also covered.

In our analysis chapter, Chapter IV, we discussed how overhead costs were allocated at each of the three researched sites. We saw that the allocation of overhead is based on productive manhours but that each site has had a different interpretation of productive manhour. Military manhours were not included in any allocation computation at Oakland. At Tracy military manhours were included in productive manhours when allocating G&A costs but not while allocating indirect costs. While at Sharpe (SHAD) we saw that the allocation of G&A and overhead costs were performed by DESCOM by some other manner and provided to DMDC for input.

It was also shown that the percentage of indirect labor costs varies significantly at each of the sites. Additionally, the percentage of overhead allocated to the output measures varies at each of the sites.

The high cost of direct labor, high unit costs and the "inefficiency" at Sharpe when compared to Oakland and Tracy was also discussed.

B. FUTURE RESEARCH AREAS

The concept of unit costs in DOD is an evolving area and this project provided us with an opportunity to witness rapid changes in guidelines and policies. It also gave us a chance to see other possible questions which could be researched. These questions include:

1.) Trend Analysis. Fiscal year 1989 is the first year for which unit cost data was captured by DMDC. By the mid-90's sufficient data should be available for a researcher to perform a trend analysis to see how, where and if costs have decreased. As discussed in Chapter II, the unit cost concept is currently being extended to cover eight functional areas such as health care, recruiting, military training and commissaries. Research and trend analysis does not need to be limited to unit costs at supply depots.

2.) Implementation Study. A researcher could study how unit cost concepts were implemented at an activity. One could investigate if the implementation of unit costs changed the organization of that activity and if it did, how did it change. A study comparing the implementation at several similar activities could be performed.

3.) Consolidation Study. As discussed in Chapter II, future plans for DDRW call for optimal use of the WDF at Sharpe and Tracy to be used as the primary hub for receiving, issuing and storing of material. A study of the impact of these plans on the utilization of the facilities at NSC

Oakland could be investigated. Additionally, research could be performed to see if customer support for the current customers of any of the sites consolidated changed. Specifically, one could investigate the change in support of the afloat and ashore customers of NSC Oakland after the physical distribution function at NSC Oakland shifted to DDRW.

4.) ADP Consolidation. The consolidation of the three sites under DDRW has mandated that either each of the computer systems at the sites be able to talk to each other or that a new ADP system be installed at each of the sites. The effects on an organization of implementing a change to ADP software and hardware is an area rich in research possibilities.

5.) Unit Cost and Employee Gain Sharing. A study could be performed to see how the implementation of unit costs and employee gain sharing programs are faring. Employee Gain Sharing programs have already been initiated at several DOD supply depots prior to unit cost resourcing. The effects of unit cost resourcing on the employee gain sharing programs could be studied.

APPENDIX A

DLA COST ACCOUNTING CODES

	* Receipts *
320	Bin Receipts
321	Bin Receipts
322	Bulk Receipts
	* Issues *
330	Bin Issues
331	Bin Issues
332	Bulk Issues
340	Bulk Issues
340	Bulk Issues
341	Bulk Issues
362	Bulk Issues (Mechanicsburg Only)
	* Other Outputs *
31 /TWD	Alameda
32 /TWD	Alameda
33 /TWD	Alameda
35 /TWD	Alameda
323	DICOMSS
333	DICOMSS
334	CCP Operations
335	DODDS
356	Reimburse PPP&M
361	Humanitarian Assistance
363/TWT	TRAYPACK
364	Shoe Last (Columbus Only)
364	Maintenance (Ogden & Richmond Only)
365	Unit/Set Assembly
366	Unit/Set Assembly (Mechanicsburg Only)
366	DEPMEDS (Ogden & Richmond Only)
368	Reimburse PPP&M
369	Center Directed Work
370	Storage Aids
374	Storage Aids
377	Storage Aids
371	Workaround
372	Workaround
373	Support To Others
375	Tenants
376	Support To Others
379	Earthquake
95101	Stay In School

```
          * Operations Overhead *
338
362
363        All '363' Accounts Where ORG=TWT
31         All '31' Accounts Where ORG=TWD
35         All '35' Accounts Where ORG=TWD And ACCT=355 or 356
761        Military
OBJ=90     Military

          * Other Missions* *
349        2nd Destination Transportation
9 /OBJ=97  G&A Reimburseables
378        Piketon Facilities (Columbus Only)
928        DERA

          * G&A *
750
751        SWPC
9          All Accounts Beginning with '9' Except '928' And
           '95101' (981,982,983 Are Excluded)
```

APPENDIX B

NAVY COST ACCOUNTS

	* Receipts *
212B	Receiving
	* Issues *
212C	Issuing
212D	Packing
212J	MHE/AHMS Rental
	* Consolidated O&M Functions *
212E	Local Delivery
	* Operations Overhead *
211A	Stock Control Overhead
211D	Stock Point Plan
212A	Warehouse Overhead
212F	Physical Inventory
212H	Storage
212K	
2132	Rewarehousing
21Y0	
21Z0	Allocated Credit
21Z1	Allocated Credit
	* Navy Fleet & Industrial Support CTR-Stock Fund *
1C4A	Financial Inventory Accounting
211B	Inventory Management
211C	Technical Services
211E	Outfitting
212G	Repairables Management
231M	SERVMART
	* Navy Fleet & Industrial Support CTR-O&M *
1C4B	Navy Stock Fund Accounting
1C4C,1C4D, 1C4E,1C4F, 1C4H,1C4X	Financial Services
212L	Hazardous Material
6E	Hazardous Material
212M	Special Weapons
22	Retrograde Rep
231C	Personal Property
23	Other Mission Operations
27	Procurement Operations

28	Regional Contracting
	Tenant Support Gets % of G&A
	* G&A *
1A	Command & Admin
1C	Resource Management
1D	Training
1H	ADP
1J	Admin Support Services
1R	Statistical Accounts
1X	Undistributed
231E	Lumber/Timber
232A	Tech/Admin Support
232C	ICP Analysis
11	
14	
29	Project Management
62	Transportation
63	Transportation
64	Transportation
65	Transportation
66	Transportation
67	Transportation
68	Transportation
69	Transportation
70	Minor Construction
71	Real Property Maintenance
72	Real Property Maintenance
73	Real Property Maintenance
74	Real Property Maintenance
75	Real Property Maintenance
76	Real Property Maintenance
77	Real Property Maintenance
78	Real Property Maintenance
79	Real Property Maintenance
80	Utilities
81	Utilities
82	Utilities
83	Utilities
84	Utilities
85	Utilities
86	Utilities
87	Utilities
88	Utilities
89	
91	PWC Administration
92	Housekeeping/Other
93	Other Engineering
99	

APPENDIX C

Army Supply Depot AMS Cost Codes

	* Receipts *
7A20A	Receipt Other Supply
7A20B	Packing For Storage
7A20C	PP for Storage
7A20D	Cont MFT-Receipts
7A20E	Receipt Inspection
7A20F	PPP Inspection
7A20G	Traffic Management
	* Issues *
7B20A	Pack For Shipment
7B20B	Bulk Issue
7B20C	Bin Issue
7B20D	Shipment
7B20E	PP For Shipment
7B20F	Cont MFT
7B20G	Shipment Inspection
7B20H	PPP Inspection
7B20J	Transhipment-Non DSS
7B20K	Traffic Management
	* Other Outputs-Stock Fund *
7D20A	Set Assembly
7D20B	Set Assembly Inspection
7M20A	CCP Cont Mfr
7M20B	CCP Trans Inspection
7M20C	CCP Trans O/S DSS
7M20D	CCP Traffic Management
7K20A	COSIS-Mtl Movement
7K20B	COSIS-Exercising
7K20C	COSIS-P&P F/STNG
7K20D	COSIS-P&P Inspection
7K20E	COSIS-Minor Repair & Adjustment
7K20F	COSIS-Cont Mfr
7L20A	COSIS-Cyclic Inspection
7L20B	Special Inspection
	* Army Depot Functions-O&M *
7P20A	UMFP-Unit Matl Storage & Inspection
7P20B	UMFP-Unit Matl Packing
7P20C	UMFP Unit Matl Traffic
7V20A	AOD/MOD Transition
7E20A	Tech Assistance
7M50A	European Retrograde

	* Other Missions *
7R20A	Household Goods
	* Operations Overhead *
7C20A	COMIS-O/S
7C20B	Spec Proc Non-ASF
7C20C	Bulk Fuel/Lube Oil
7F20A	Inventory
7H20A	Rewarehousing

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