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STUDY TO IMPROVE REAL PROPERTY OPERATIONS AND MAINTENANCE IN THE U. S. ARMY

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PREPARED FOR DEPARTMENT OF THE ARMY
OFFICE, CHIEF OF ENGINEERS

BY
LESTER B. KNIGHT & ASSOCIATES, INC.
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Objective analyses of the Operations and Maintenance (O&M) component of the Real Property Management System (RPMS) indicate that system management and execution cannot be optimized under a decentralized organizational concept. Although, several positive measures have been and are being taken to improve the Army's management of its real property, these do not provide an optimal
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solution to the Army's operation and maintenance problems. Although work load continues to increase, the available personnel resources continue to decline. This shortfall of resources potentially impacts Army readiness and the soldiers' quality of life.

Comparison of the strengths and weaknesses of various alternatives for organizational alignment demonstrates that the best balance of installation needs, asset protection, and cost-efficient operations can be attained through establishment of an engineer command utilizing a revolving fund for RPMA. Adoption of this concept will not only improve overall system management, but, at a minimum, has the potential to reduce personnel requirements in the Continental United States by approximately 1,400 spaces.

Under the prepared concept the Corps of Engineers field organization is consolidated with the facilities engineers organization. The consolidated organization is to provide RPMA services to the installation on a reimbursable basis through a revolving fund. The major commands and the installations will continue to be responsible for identifying requirements, setting priorities, and programming and budgeting appropriate funds.

Management, planning, engineering, technical, and contracting support will be provided to the installations by divisions and districts. Recurring services, maintenance and repair, and utilities operations will continue to be executed by a work force located at the installation. This concept, while continuing facilities engineering services at the installation, augments those services with the Corps' engineering and contracting capacity and its long experience with revolving fund operations.

Because of the complexity of the present system and the magnitude of the management realignment required, implementation of the proposed system will need to be undertaken with caution and in a planned and orderly manner. Therefore, a 5-year strategy for implementation is recommended. This implementation strategy includes establishment of pilot programs to facilitate development of detailed operating procedures and systems.

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October 20, 1978

Department of the Army
Office, Chief of Engineers
1000 Independence Avenue, S.W.
Washington, D.C. 20314

Reference: Contract No. DACA 73-77-C-0010

Gentlemen:

We are pleased to submit the original and 20 copies of our final report of the study to improve Real Property Operations and Maintenance in the U.S. Army.

The objective of the Real Property Management System and its Operations and Maintenance component is to provide a quality working and living environment for Army personnel, while supporting the total Army in attainment of its military readiness goal. Over the last ten years, a number of Department of the Army studies have been conducted to identify opportunities for improvement in this very complex system.

The purpose of this study was to provide the Army with an objective, outside view as an aid to planning the evolution and development of the facilities engineering function so as to meet future requirements within projected constraints. To this end, we have evaluated the present Army Command Management System, as well as various alternatives to the management structure for operations and maintenance. On the basis of these evaluations, we have developed an organizational and operational strategy which we are confident will result in significant improvements to the Operations and Maintenance component of the Real Property Management System.

We appreciate the cooperation and assistance received from the Department of the Army personnel during the performance of this study.

Very truly yours,

Lester B. Knight & Associates, Inc.

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202/659-5120

TABLE OF CONTENTS

78 12 11 130

TABLE OF CONTENTS

		Page
	Letter of Transmittal	
	Table of Contents	i-1
	List of Exhibits	ii-1
I	Executive Summary	1
II	Purpose, Scope and Methodology	8
III	Background	10
IV	Real Property Operations and Maintenance in the U.S. Army - Evolution To Date - System Overview - Materiel Development and Readiness Command (DARCOM) - United States Army Europe (USAREUR) - Corps of Engineers - Reserve Centers - Housing - Consolidations - Contracting - Integrated Facility System (IFS)	13
V	Real Property Operations and Maintenance in the Navy, Air Force, and Federal Agencies - Navy - Air Force - National Aeronautics and Space Administration (NASA) - General Services Administration (GSA) - U.S. Postal Service	30
VI	Real Property Operations and Maintenance in Industry, Universities, and Local Government - Industry - Universities - Municipal Governments - Management Concepts	39

VII	Problem Areas in the Army's Real Property System - General System - DARCOM - Summary	51
VIII	Evaluation of Alternatives - Strengths and Weaknesses - Ranking of Alternatives - Resource Analysis	62
IX	Recommendations and Benefits - Organizational Concept - Management Process - Benefits - Additional Recommendations	73
X	Implementation Strategy - Implementation Time Table	88

Appendices

A - Installation Overhead
B - Installation Contract
C - Resource Analysis
D - Interviews and Visits Conducted
E - DA and MACOM Comments

LIST OF EXHIBITS

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Exhibit	Title	Following Page
III-1	Real Property Replacement Costs	10
III-2	RPMA Expenditures	10
III-3	Backlog of Maintenance and Repair	10
III-4	Military Program Construction Funding	10
III-5	Life Cycle Cost for a Typical Building	10
IV-1	Typical Facilities Engineering Organization	15
IV-2	USAREUR Organization	20
IV-3	Functional Stratification of Corps	23
IV-4	Flow of OMAR Funds to Reserve Centers	24
V-1	Scale of RPMA Program of the Military Services	30
V-2	Typical Navy Public Works Department	30
V-3	Position of Public Works Department in Navy Facilities Engineering Organization	30
V-4	Typical Navy Public Works Center	30
V-5	Navy Public Works Centers	30
V-6	Position of Public Works Center in Navy Facilities Engineering Organization	31
V-7	Maintenance Management Control Indices	31
V-8	Typical Air Force Base Civil Engineering Department	34
V-9	Air Force Staff Organization for RPMA	34
V-10	Typical Air Force MAJCOM Engineering and Services Organization	34
V-11	Appropriated Fund Project Approval Levels	35
V-12	Typical Major NASA Facilities Engineering Organization	36
VI-1	Typical Corporate Organization Structure	39
VI-2	Organization Chart for Maintenance Function of Typical Manufacturing Plant	40
VI-3	Organization Chart for Maintenance Function of a University	43
VI-4	Organization Chart for Maintenance Function of a Small City	44
VI-5	Organization Chart for Maintenance Function of a Large City	45
VII-1	List of Reports	54
VII-2	TRADOC Fire Damage Report	56
VII-3	Example of BOS Cost Data	57
VII-4	CONUS RPMA Manpower Trend	59

VIII-1	Present Command Management System	63
VIII-2	Stovepipe to MACOM	63
VIII-3	Stovepipe to COE	63
VIII-4	Engineering Command Utilizing a Revolving Fund	64
VIII-5	Strengths and Weaknesses of Army Command System	70
VIII-6	Strengths and Weaknesses of Stovepipe to MACOM	70
VIII-7	Strengths and Weaknesses of Stovepipe to COE	70
VIII-8	Strengths and Weaknesses of Engineering Command Utilizing Revolving Fund	70
VIII-9	Relative Importance of Ranking Criteria	70
VIII-10	Relative Impact of Alternatives on Criteria	71
VIII-11	Weighted Score of Alternatives	71
VIII-12	Potential Norfolk Area Savings	72
VIII-13	Potential CONUS Savings	72
IX-1	Proposed Organization Structure	75
IX-2	Proposed Management Process	77
IX-3	Proposed Revolving Fund	78
IX-4	Flow of OMAR Funds to Reserve Centers	81
IX-5	Summary of Estimated Cost and Benefits	83
X-1	Proposed Rating Scheme	89
X-2	Implementation Schedule and Key Milestones	90
X-3	Pilot Program Measurement Factors	91

I. EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

The Army's Real Property Management System (RPMS) constitutes a complex and diverse enterprise. Accordingly, planning, managing, executing, and controlling the functions involved, in many parts of the world, present significant management challenges.

While RPMS is increasingly being recognized as a total system, its major components (requirements, programming, acquisition, operations and maintenance, and disposal) are not fully integrated. They are not tied together organizationally or in execution and control, and are integrated to only a limited extent through the Army's planning, programming, and budgeting system.

One of the largest (FY 79 estimate of $1.96 billion in expenditures and a personnel complement of 49,000) and most troublesome components, or subsystems, within RPMS is Operations and Maintenance (O&M). Over the last 10 to 15 years, a number of intensive studies of O&M have led to many improvements in the way O&M is managed and performed. However, none of these studies analyzed alternative organizational alignments in depth. Therefore, to assist the Army in planning the future direction of the management of Real Property Maintenance Activities (RPMA), it is intended that this analysis provide the Department of the Army with an independent, objective view of RPMA performance and identify the optimum management approach for the future.

The trade-offs between overall Army mission and readiness and RPMA performance are intricate. Available data do not lend themselves to precise quantitative analysis of alternatives. Industry and civilian agencies of the Government generally do not provide comparable models, because of their smaller scale of operation and because of the lack of comparability to the Army environment. Senior commanders and staff officers throughout the command structure may not, because of lack of direct experience, fully understand all the dimensions of the operating problems involved.

There are no simple answers to the question of whether RPMA performance can continue to keep pace through incremental changes in the system, or whether the Department of the Army (DA) must consider basic changes in the organizational alignment and management processes. Great risks are involved in undertaking basic changes in a system of this magnitude unless those changes are fully supported by the preponderance of evidence and can be shown to be justified and feasible. On the other hand, the risks can be almost as great if a growing need for change is shown to exist and is not decisively addressed.

Previous Army studies - particularly the systems descriptions, analyses, and recommendations of the Phase I report - were used in the analysis of the present system and alternative approaches. Excellent cooperation was received at all levels of the Army from DA staff to installation, and continuing guidance was provided by the Army Study Advisory Group

(SAG) and the staff of the Facilities Engineering Directorate of the Office, Chief of Engineers (OCE).

System Perceptions

The system is not viewed in completely consistent terms throughout the organizational hierarchy.

There is certainly not, on the basis of our interviews, a consensus at any level favoring organizational change. Because of changes and improvements brought about since the Lincoln Report, the system is working better. The establishment of the Facilities Engineering Directorate in OCE in 1973 gave the facilities engineer greater visibility and support.

However, some negative views of the present system do occur at the installation or community level. From the point of view of the facilities engineer, these include the following:

- The resource allocation process works too slowly, and fourth-quarter efforts to compensate do not really resolve the problem.
- The growth in "stovepiping" and "fencing" is at odds with the principles of the current system.
- While some progress has been made toward meeting the critically important personnel and career progression problems of the facilities engineer, the core elements of those problems remain.
- Support systems (supply, for example) continue to cause service delays and interruptions.

In the broader perspective of commanders:

- The present system, while it has flaws, does cause O&M to function within the overall Army framework and to compete for resources with other important activities.
- There is no reason for confidence that any other organizational arrangement would serve commanders as well.
- Many alternative organizational arrangements would remove some resources from the control of the installation commander.
- The commitment of others (for example, the Corps' division and district organization) to accept full responsibility for the difficult and unrewarding task of facilities engineering or O&M is uncertain.

Established trends, such as consolidation and contracting-out, may also reduce the commander's O&M control, but since these developments are gradual, they are not perceived as so much of a threat as is abrupt organizational change.

Performance Appraisal

Judging system performance depends largely on assumptions regarding systems objectives and their relative importance (for example, customer satisfaction vs. capital asset utilization, or long-term facility conservation and enhancement vs. reduction in current operating expense). Then too, in this rapidly changing environment, adequate performance may become less than adequate in the future.

For all the reasons discussed briefly here and explained in greater detail in the body of the report, the Army should consider some gradual changes in the system, for the following reasons:

- The present system is costly because of the fixed expenses associated with establishing total facilities engineering capability at each of the Army's installations, along with the replication of many of the technical functions at each organizational level.

- Numerous regulatory instructions and directives are characteristic of this type of management system, with its long and sometimes indirect lines of communication, decentralized decision-making, and transfer of resources to meet many system objectives.

- The current system combines, at the facilities engineer's level, two very different groups of activities: on the one hand, those day-to-day maintenance and repair (M&R) and related activities which are a vital continuing part of the individual facility's or community's operations; and, on the other, technical review, financial and utilization analysis of capital facilities, master planning, and engineering design functions which need not be performed on-site and under the commander's direct control as long as they do serve the commander's needs. Given the present level of resources and other constraints, it will be very difficult for the facilities engineer to continue to perform both sets of functions at the installation level.

- Detailed planning, particularly that involving installation master plans and annual work plans, does not contribute adequately to improved execution or to more informed decision-making at top staff levels.

- Accounting and resource management procedures need to be simplified to provide proper O&M visibility for commanders. The complexity of the current approach may, instead of preserving the integrity of the Army Command Management System by vesting full authority in the line commander, simply shift control of RPMA from one staff channel (the facilities engineer) to another (the Resource Management Office).

- While the level of the Backlog of Maintenance and Repair (BMAR) has deficiencies as a performance indicator, it is increasing under the present system, and DA experiences difficulty in justifying its level of O&M expenditures to Congress.

- The O&M work load continues to increase while the available resources continue to decline. For this reason, increasing emphasis is placed on contracting-out. Although this is an appropriate response to resource constraints, unless functional responsibilities are realigned to accommodate this trend, and unless the required contract management skills are provided, contracting-out may increase costs and reduce responsiveness.

Consideration of Alternative Management Concepts

The present RPMA approach within ACMS has obvious advantages; specifically:

- It is a functioning system, and both commanders and FE's are relatively satisfied with it.

- The cost and management efforts involved in changing a system of this magnitude are considerable.

- Most important, it is consistent with the Army's basic command philosophy.

It is concluded, nonetheless, that the present approach will have to be altered, for the following reasons:

- The cost of operating through the current organization structure and employing today's management processes may prove to be too high, as compared with other approaches.

- The increasing complexity of RPMA may require changes in the way technical and functional leadership is exercised.

- Other DA (and Department of Defense) policy decisions regarding consolidation, contracting, and even other elements of base operations may cause the current system to change.

The analysis indicates that, while continuing the current approach within ACMS is desirable for several reasons, it may be an approach the Army can neither afford nor justify in the years ahead.

In analyzing alternative ways of organizing and managing RPMA, it becomes evident that there are no simple options which are clearly superior in every respect to the present system. Each option presents its own unique set of advantages and disadvantages.

Some of the available options can be discarded through weighing those advantages and disadvantages. For example, given the resource and cost pressures causing problems in the present system, it is probably not feasible to consider establishing a new DA organization (such as a new major command with the sole mission of providing RPMA support). The analysis suggests that the only practical way to consider a totally new system is to build on organizations already in place and already possessing some or all of the required capabilities together with established service/support relationships.

It appears, for these reasons, that neither the present system nor any other single option can satisfy the Army's requirements, and that the system strategy selected must include a combination of management concepts. Thus, the advantages of the current approach can be preserved, while adding those system elements which serve to increase emphasis on cost and resource control, on longer range planning and capital asset utilization, and on technical and engineering leadership.

Recommendation

On the basis of analyses of problems in the current system and consideration of trends to more intensive management, as well as evaluation of alternative concepts, it is recommended that the Corps of Engineers be assigned O&M management and execution responsibility. This realignment of O&M responsibility is to be accomplished in part by the consolidation of the installation FE organizations with the Corps of Engineers field organization. As presented in detail in Section IX of the report, this consolidated organization is to be integrated within the Corps division/district organization structure. An assigned FE work force is to be located at each installation to perform all necessary recurring maintenance activities. Most of the design and analysis for nonrecurring activities is to be accomplished by a centralized staff at the district office.

To ensure proper consideration of the needs of the installation commander and to retain the basic philosophy of the command management system, this recommended structure is to be established within the framework of a revolving fund. Use of the revolving fund enables the commander to retain responsibility for identifying requirements, pro-

gramming, and budgeting. The revolving fund concept establishes a buyer-seller relationship between the installation and the FE organization. In other words, use of the revolving fund enables the installation commander to determine what should be done and when, but leaves RPMA performance the responsibility of engineers skilled in the techniques of operations and maintenance.

Although this alternative to the present decentralized approach has recognized merits in terms of efficiency, resource utilization, cost-consciousness, and overall flexibility to adapt to changing environments, it is not without risk. The Army philosophy of providing maximum authority to installation commanders is in conflict with the preferred organizational concept, which would take authorized personnel spaces for RPMA functions from the commander and limit his authority and control of FE activities. Undoubtedly, commanders may resist this concept as they have "stovepipes" which have recently been installed for management of installation commissaries, data processing, medical services, etc. All of these functions, once managed by commanders, have been removed from their control for many of the same reasons as those cited for RPMA.

The recommended strategy attempts to bridge the gap between the commander's loss of control of RPMA in a stovepipe organization and the present decentralized system by utilization of a revolving fund concept whereby programming, budgeting, and priority setting for dollar resources remain within the commander's span of control.

This organizational concept will be a management challenge to the Corps of Engineers. The ultimate responsibility for executing RPMA Army-wide will rest clearly with OCE. Districts will be required to be involved in day-to-day operational problems, conflicts, and consultations, all of which require expert management ability.

Benefits

Implementation of recommended management structure and process will result in significant improvements in the operation of the Army's real property system:

- Consolidation of personnel resources - Analysis indicates that implementation of the recommended structure should result in a minimum savings of approximately 1,400 spaces in the continental U.S. Most major active military installations currently have Corps of Engineers resident, project, or area offices. The recommended concept integrates these field offices with the FE organizations.

- Improved cost identification - The revolving fund concept provides incentives for cost control through identification of total cost. Navy headquarters staff have indicated

that establishment of revolving funds in Public Works Centers has resulted in a reduction of 10% in "discretionary" requirements.

- Improved technical direction - The proposed concept is more responsive to the changing needs of the Army. The ability to contract for services on a national or regional basis is enhanced because of the expanded contracting capability of the consolidated organization. The existing contracting capabilities of the Corps of Engineers can be utilized in O&M.

- Integratation of RPMS - Probably the most important benefit, but also the most difficult to quantify, is the potential for true life cycle management. Under the recommended concept, RPMS becomes a fully integrated system directed by the Chief of Engineers.

Implementation Strategy

Implementation of the recommended management structure and process will require substantial planning to bring about an orderly transition from the present ACMS to the proposed organization. It is recommended that the implementation process include pilot programs with major commands including FORSCOM, TRADOC, and DARCOM participation. These pilot programs are necessary to develop the detailed processes, procedures, and structures of the proposed system.

The total implementation time frame is estimated at five years. Section X of the report contains a proposed schedule and identifies the key implementation milestones. This schedule is subject to timely decision-making regarding all major approval requirements.

II. PURPOSE, SCOPE, AND METHODOLOGY

II. PURPOSE, SCOPE, AND METHODOLOGY

This study is Phase II of a two-phase study effort under the direction of the Office of the Chief of Engineers (OCE). Phase I was a Department of the Army study that was completed in March 1978. The purpose of the Phase I study was to identify opportunities and means of improving real property operations and maintenance effectiveness and efficiency within the existing organizational and management structure. The Phase II study was undertaken to provide the Army with an objective outside view in order to determine opportunities for improvement considering totally new concepts, including major organizational and management realignments.

The scope of the study included examination of the operations and maintenance component of the Real Property Management System (RPMS), Army-wide, from the point of view of achieving improved results through alternative organizational alignments and management procedures. Organizational alternatives considered in this study ranged from a decentralized system, such as the current Army Command Management System, to a functional "stovepipe" concept. Management information systems, contracting procedures, and other subsystems were addressed to the extent necessary to permit evaluation of the primary management alternatives and to develop an implementation strategy.

Consideration of alternatives was limited to those systems that could be implemented within the Department of the Army. In addition, the following assumptions governed the study effort:

- The current Real Property Management Activities (RPMA) funding level for O&M will remain relatively constant in terms of FY 77 dollars.
- Current manpower authorization for the O&M component of RPMS will not be increased.
- Addition of new facilities to the current real property inventory will continue to increase the total O&M work load.

The study methodology involved four parts, as follows:

- Part I - The preliminary phase consisted of initial orientation and the development of a plan of study. The study plan was approved by the Study Advisory Group (SAG).
- Part II - The review phase involved investigations of real property maintenance systems in industry, universities, trade associations, state and local governments, Navy, Air Force, Federal agencies, Army installations, Army Major Commands (MACOM's), and Corps of Engineers (CE) divisions/districts. In addition, applicable written material was reviewed and interviews were conducted to examine on-going research in the

field of real property management. Since the Department of the Army Phase I study developed detailed descriptions of the current Army RPMS, a major activity of this phase was to review data and material from that work. A list of interviews conducted is contained in Appendix D.

- Part III - The evaluation and analysis phase encompassed the identification of alternative systems for managing the Army's O&M component of RPMS, as well as the evaluation of these alternatives. On the basis of their relative advantages, a preferred alternative was identified and an implementation strategy developed.

- Part IV - In the final report phase, the draft report was distributed for review and comments before submission of the final report. Comments and suggestions were analyzed by the study team and incorporated into the final report, as appropriate.

III. BACKGROUND

III. BACKGROUND

The Army's Real Property Management System is comprised of five components: (1) requirements, (2) programming, (3) acquisition, (4) operations and maintenance, and (5) disposal. These components encompass the activities necessary to acquire, manage, and maintain real property assets that have an estimated replacement cost of almost $80 billion. (See Exhibit III-1, following this page.)

A recent review of the RPMS by the Army indicated that the majority of these components are working reasonably well. However, although major progress and continuing improvement have been achieved, the O&M component, which represents expenditures of $1.96 billion and personnel levels of approximately 49,000 (FY 79), still faces serious problems brought about by a variety of factors. External trends indicate that these problems will continue and intensify in future years.

Despite an increase in Real Property Maintenance Activities expenditures from $1.25 billion in 1972 to $1.68 billion in 1976 (expressed in constant dollars), as shown graphically in Exhibit III-2, the Army's real property maintenance and repair backlog has grown to $1.186 billion (as indicated in the 1977 transitional quarter shown on Exhibit III-3), the highest level in history. The major portion of the identified backlog (approximately 75%) is in Europe.

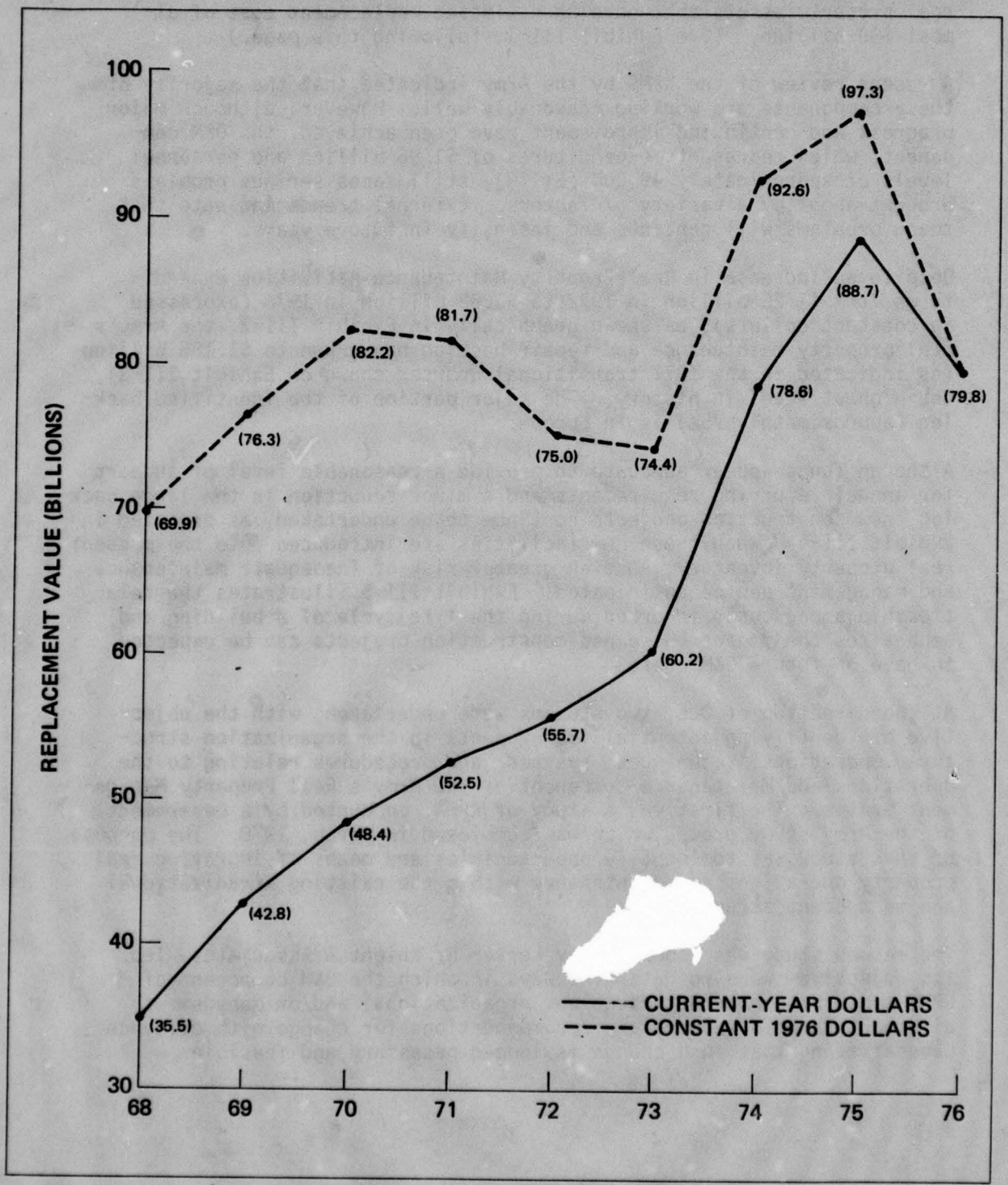
Although funds appear adequate to provide a reasonable level of support for annual recurring requirements and a minor reduction in the large backlog, new construction projects continue to be undertaken, as depicted in Exhibit III-4. When these new facilities are introduced into the present real property inventory, an even greater risk of inadequate maintenance and management can be anticipated. Exhibit III-5 illustrates the relationship among costs incurred during the life cycle of a building and emphasizes the impact these new construction projects can be expected to have on future O&M costs.

At the direction of OCE, two studies were undertaken, with the objective of identifying potential improvements in the organization structure, operations, techniques, systems, and procedures relating to the Operations and Maintenance component of the Army's Real Property Management System. The first was a study of RPMA, conducted by a Department of the Army study group, which was completed in March, 1978. The purpose of that study was to identify opportunities and means of improving real property operations and maintenance within the existing organizational and management structure.

The second study was conducted by Lester B. Knight & Associates, Inc. Its objectives were to determine ways in which the O&M component of RPMS could be improved through new organizational and/or management alignments and to support any recommendations for change with evidence demonstrating that such change is indeed necessary and feasible.

EXHIBIT III-1

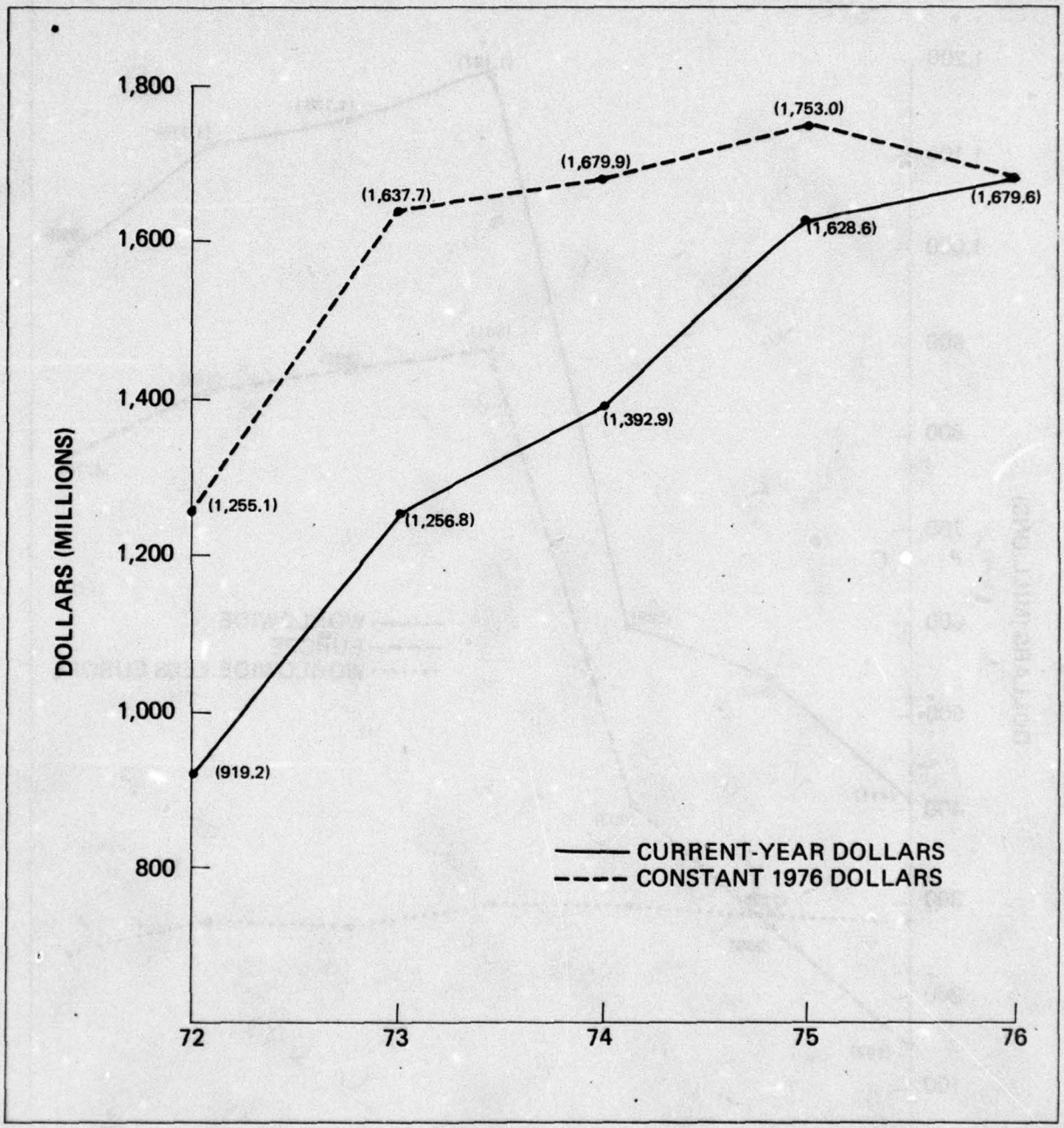
REAL PROPERTY REPLACEMENT COSTS



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT III-2

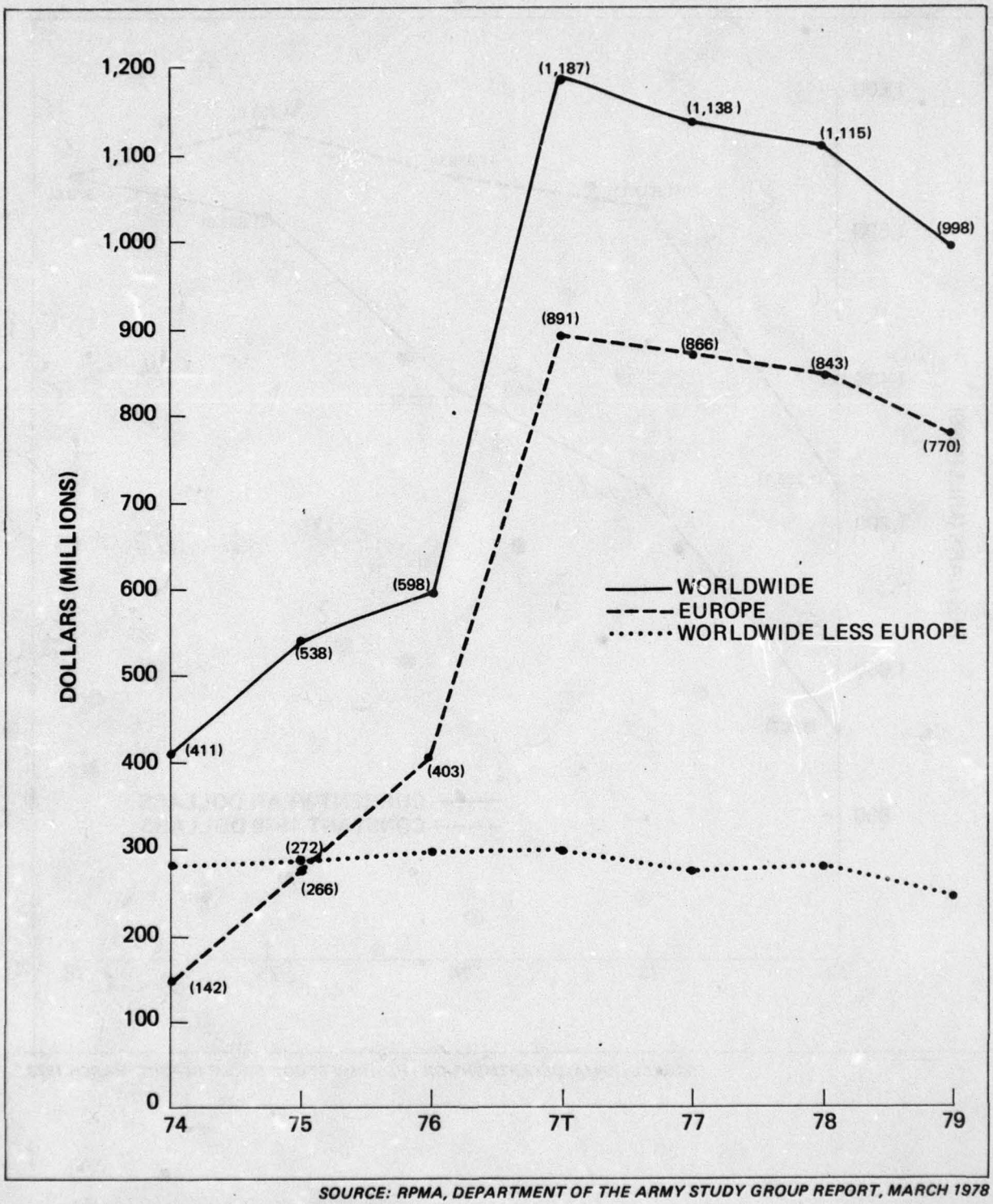
RPMA EXPENDITURES



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT III-3

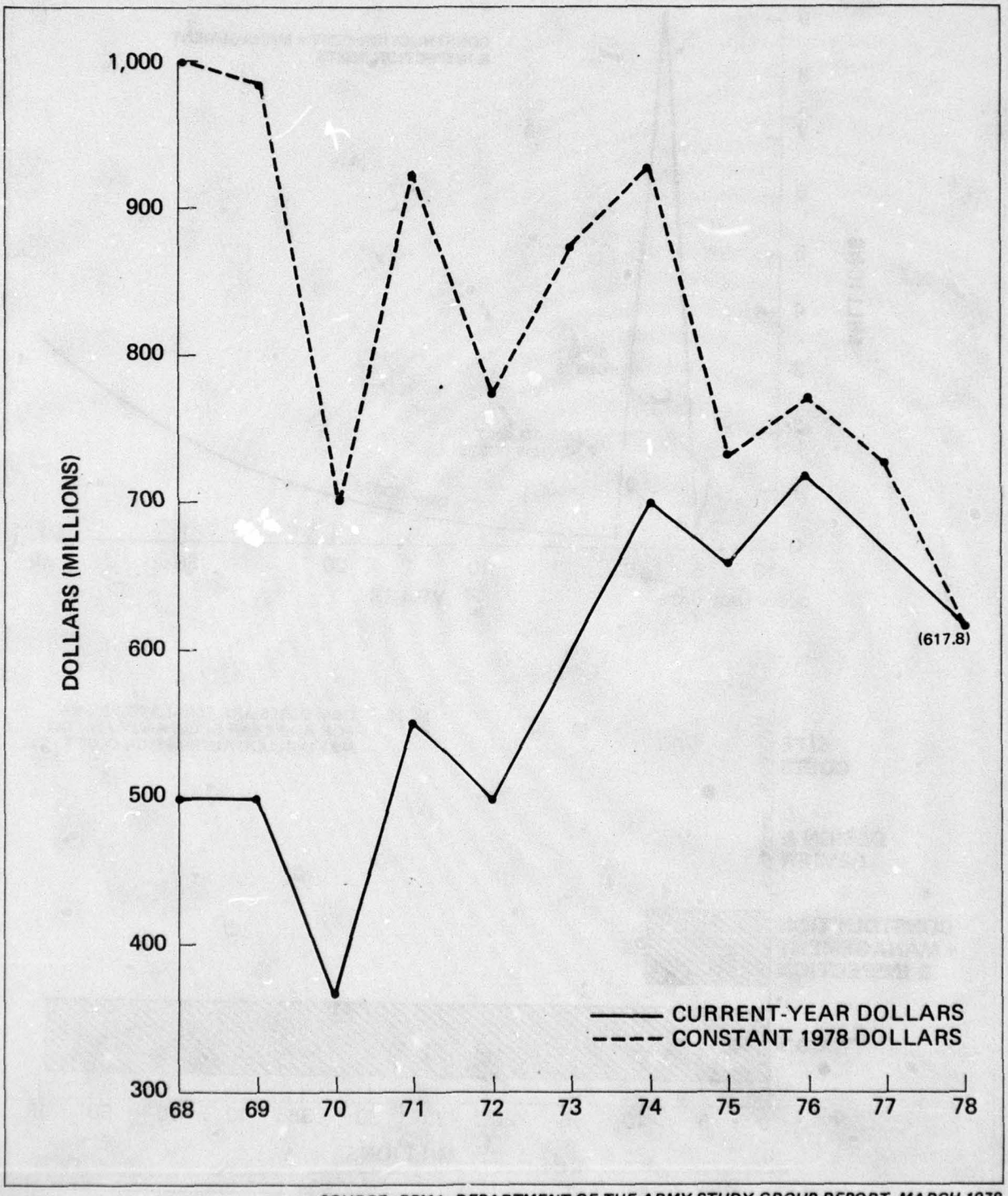
BACKLOG OF MAINTENANCE AND REPAIR



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT III-4

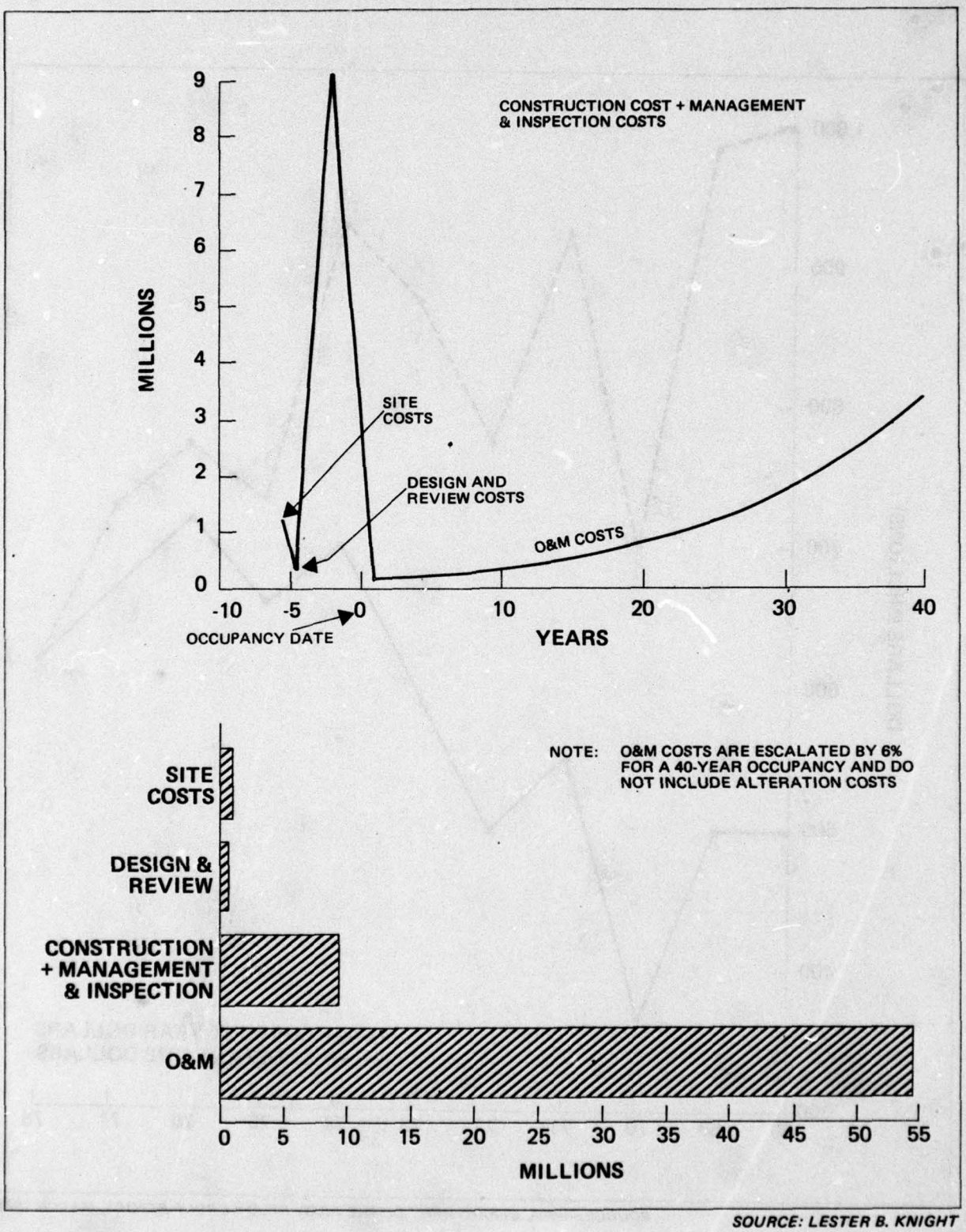
MILITARY CONSTRUCTION PROGRAM FUNDING



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT III-5

LIFE-CYCLE COST FOR A TYPICAL BUILDING



SOURCE: LESTER B. KNIGHT

This study recognizes that any realignment of RPMA is a complex issue. Optimal operation of the RPMA system presents only one set of considerations, since the system must support the Army's primary mission objectives of troop training, weapon production, and force deployment. Many levels of expertise and technology are involved in the planning and execution of RPMA, from carpenters and custodians to industrial engineers and environmental experts. RPMA is managed and controlled by various authorities and directorates having varying degrees and depth of involvement, including Congress, DA, MACOM's, and Army installations. Moreover, the present system operates in a rapidly changing environment which has increased the complexity of the RPMA work load in areas involving energy conservation, and OSHA and EPA compliance.

The ever-present interaction between RPMA and Army mission requirements has led some observers to question whether RPMS is actually a functional system with integrated components directed toward real property asset management, or whether its objectives, like those of other service and support systems, shift from time to time as mission and readiness priorities dictate.

There are no simple solutions to the complex problem of optimizing RPMA management. It is intended that this study provide DA with an independent, objective view of RPMA performance to assist in planning future direction for these important functions.

Since just prior to World War II, the functions incorporated today under RPMA have been managed by the Army in a variety of ways. The management alignment for RPMA evolved from a totally autonomous management approach under the Chief of Engineers to the present Army Command Management System, in which the Chief of Engineers' role is that of technical director and policy adviser. In the Army Command Management System, RPMA management responsibility is aligned through the operational channels of command. Establishment of the Department of Defense and subsequent reorganizations brought about further adjustments in these alignments.

During the past ten years, numerous studies have been directed in whole or in part toward the RPMA mission. Most of these studies address such subjects as programming and budgeting, personnel (military and civilian), supply, transportation, procurement, and administrative reporting requirements.

This study effort relied as much as possible on analytical work from previous as well as current studies. Three of the studies that were used extensively as sources of background information were:

- Military Engineering in Support of U.S. Army, 1967-1975, Seeman Study Group, February, 1968. The Seeman study investigated various aspects of the engineering mission, including funding and manpower resources, backlog of maintenance and repair, role of facilities engineering within the Corps of

Engineers, and the role of Real Property Maintenance Activities within the Army.

- Total Management of Real Property Maintenance Activities, RPMA Study Group, December, 1968. The objectives of the Lincoln study were to establish Army policy, procedures, and organization structure that would optimize management of RPMA. Included was a comprehensive analysis of the total management of Army Real Property Maintenance Activities from the DA staff level to the installation level.

- Real Property Management Activities, Department of the Army Study Group, March, 1978. The purpose of this study was to identify opportunities and means of improving real property operations and maintenance effectiveness and efficiency within the existing organization and management structure.

None of the foregoing studies analyzed alternative RPMA organizational alignments in depth. The Lincoln Study did comment on the Army Command Management System as it relates to RPMA. Although the report concluded that, at the time, RPMA could continue to be conducted effectively within the ACMS framework, it also stated that "...the study group notes certain trends which are eroding ACMS. ...The prospects of continued erosion raise serious doubts about continuation of RPMA indefinitely under that system."

IV. REAL PROPERTY OPERATIONS AND MAINTENANCE IN THE U. S. ARMY

IV. REAL PROPERTY OPERATIONS AND MAINTENANCE IN THE U.S. ARMY

The Operations and Maintenance function is a major component of the Army's Real Property Management System, whose basic objectives are to design, construct, operate, and maintain the facilities needed to accomplish the Army's mission and to provide a quality living and working environment.

Over the years, a number of changes have occurred in the management processes and organizational structure of the RPMS. The system has evolved from a little-emphasized function to a highly visible and important element of the Army's operations. Although today the system is viewed by the Army as a fully integrated operation, it consists, in fact, of a number of very different and unique subsystems.

As an example of these differences, management of parts of the system (e.g., facilities engineering) is essentially decentralized and under the authority of the Army command organization, with only technical direction provided by the Corps of Engineers. However, other parts of RPMS are functionally managed by the Corps of Engineers (e.g., military construction). In addition, the regulations and directives governing the system are primarily oriented toward the requirements of the forces and training commands. As a result, it has been necessary to devise unique approaches to funding, organization, and management in such MACOM's as DARCOM, USAREUR, etc.

Additional factors that impact system management are the continuing changes in operating methods, procedures, and reporting requirements. For example, there have been significant reductions in personnel levels, resulting in added emphasis on contracting and consolidations. Since 1968, a new information system has been under development, and Congress is requiring more and more information regarding maintenance activities.

In any analysis and evaluation of the total RPMS, all of its complexities must be taken into account. The Department of the Army study group's March, 1978 report entitled Real Property Management Activities (RPMA) contains detailed descriptions of the funding and operating systems of the RPMS.

To provide a framework for analyses, this section of the report contains a broad description of the overall system and highlights aspects such as: Reserve Center Support; DARCOM and USAREUR management approaches; the Corps of Engineers' RPMS responsibilities; and management trends relating to consolidations, contracting, and Integrated Facilities System (IFS).

Evolution To-Date

Prior to World War II, the maintenance of facilities was not generally regarded as a specific Army mission. Instead, it was treated as just one of the many duties performed by installation personnel. Appropriations for the maintenance and repair of Army facilities were justified in terms of broad criteria rather than demonstrated specific requirements. Distribution of these funds was made by the Quartermaster General's office, through the Corps area and department commanders, to the installations. At the installation level, the performance of maintenance activities was the responsibility of the Repairs and Utilities (R&U) branch within the organization of the post quartermaster general.

When the Army began to mobilize for World War II and the number of facilities in the real property inventory increased, greater emphasis was placed on the Repairs and Utilities function. For this reason, in early 1941, the post utility officer was removed from the post quartermaster's organization and assigned to report directly to the post commander. On 16 December 1941, responsibility for these activities was transferred from the Quartermaster General to the Chief of Engineers, and the post Repairs and Utility function reported through the engineering chain of command.

On 9 June 1942, a new Army Regulation was published, providing that the senior officer assigned to R&U at each post would be known as the post engineer and would serve on the staff of the post commander. Under this concept, the post engineer operated in direct support of the post commander, but he received his resources and supervision from, and was directly responsible to, the CE division engineer.

A trend toward decentralization of R&U activities began in July 1942, when responsibility for the maintenance of certain exempted facilities was assigned to the chiefs of the branches concerned. Soon, however, this responsibility reverted to the Chief of Engineers, except in the case of Government-owned, agent-operated industrial plants. When the Corps areas were replaced by service commands on 1 August 1942, and the powers of the Services of Supply function were markedly increased, decentralization of R&U resumed. Although, at the departmental level, the Chief of Engineers retained staff supervision of R&U and controlled its funds, responsibility for R&U operations passed to the service command and to the post. The division engineer was no longer involved in R&U activities and the post engineer reported only to the post commander. In order to carry on the technical functions which had been performed by the district and division engineers' offices, the post engineer was gradually forced to expand his staff.

Early in 1942, the Services of Supply were redesignated the "Army Service Forces" and the Director of Real Estate and R&U in the service command headquarters became the Service Command Engineer. The following year, the R&U branch of the Construction Division in the

Office of the Chief of Engineers became a division of the Directorate of Military Construction.

Until 1950, the Chief of Engineers exercised major control over R&U funds at the departmental level. Even after the O&M funds of the technical services had been consolidated into what is now Operations and Maintenance, Army (OMA), the Chief of Engineers continued to defend the R&U budget, but his controls over its execution were considerably reduced. These controls virtually disappeared in 1958, when the Army Command Management System was created and R&U funding ceased to be identified at the departmental level. In 1967, the R&U functional activity codes were restructured and redesignated "Real Property Maintenance Activities (RPMA)."

Today, the organization for the performance of these activities generally follows the concept of the Army Command Management System. The installation engineers' organizations are under the control of installation commanders. These commanders have the responsibility for resource allocation and mission accomplishment. The role of the Chief of Engineers in the real property maintenance process is that of technical and policy adviser.

System Overview

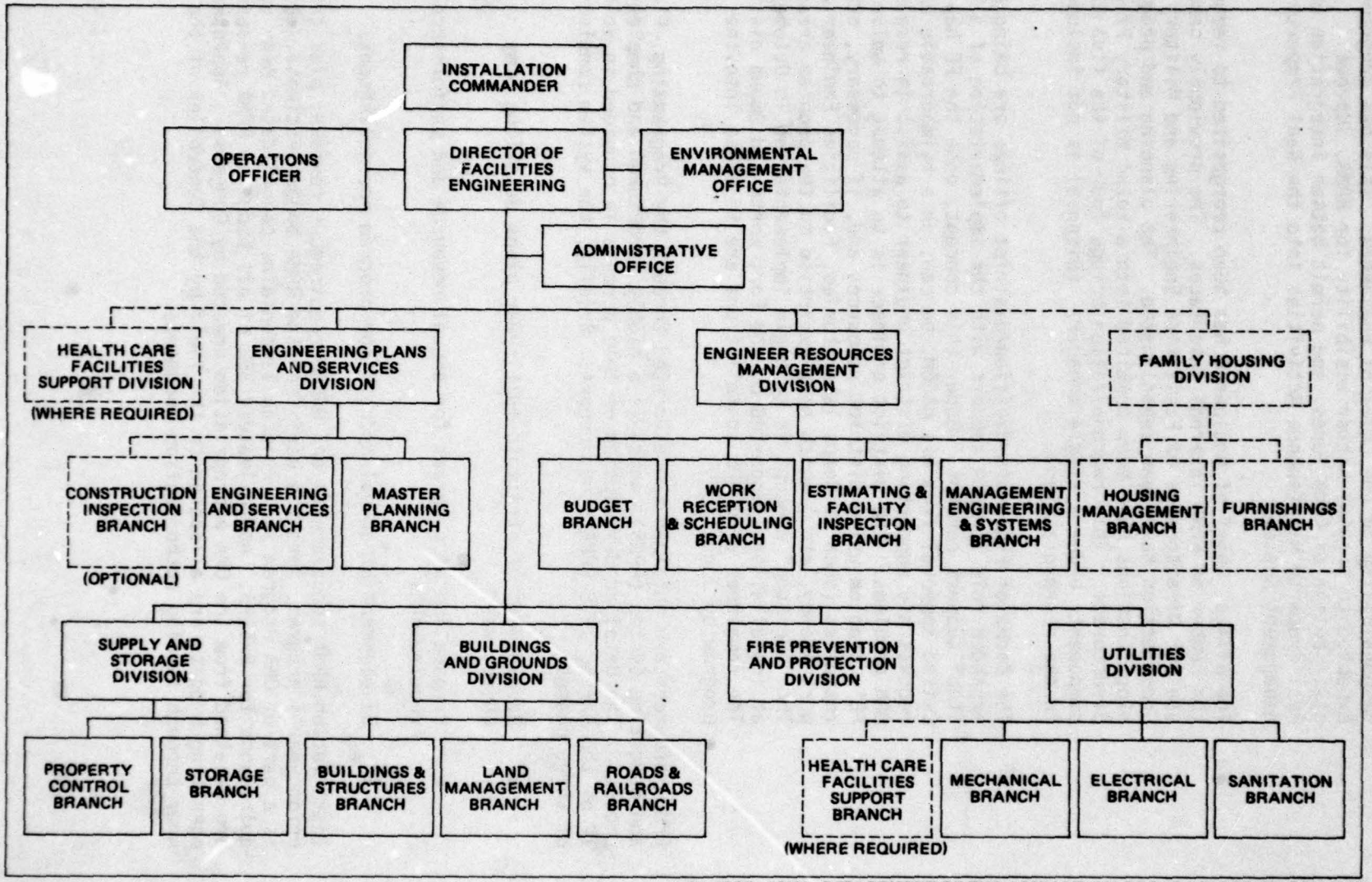
The Chief of Engineers has overall Department of the Army staff responsibility for coordinating and implementing policy and programs regarding all five RPMS components. In addition, he is responsible for the technical supervision of Real Property Management Activities which are executed through the major Army commands. Also, the Chief of Engineers has the direct mission of executing the Military Construction Program and providing backup O&M support to Army installations through the 14 divisions under his command.

Execution of RPMA is accomplished through separate facilities engineering organizations at the installations. The typical facilities engineering staff consists of 300 to 400 employees and has an annual budget of $10 million to $14 million. Exhibit IV-1, following this page, presents a typical facility engineering organization chart. The services provided by the facilities engineer are performed by a mix of in-house and contract labor. While most of the efforts of the FE are expended in the O&M component of RPMS, he is also involved in master planning, environmental issues, and concept definition of major construction projects.

Within the last few months, a number of actions have taken place which have been directed toward improving the management and performance of RPMA. These recent actions include:

- A new administrative program has been established to provide for more explicit management of RPMA. This program, which is to be fully effective in February, 1979, separates RPMA from

TYPICAL FACILITY ENGINEERING ORGANIZATION



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT IV-1

total Base Operations (BASOPS) and assigns program director responsibility to the Chief of Engineers. This new program is expected to provide better visibility for RPMA, improve distribution of RPMA funds, and permit better integration of Real Property Maintenance Activities into the Real Property Management System.

- The Office, Chief of Engineers has been reorganized to reduce the number of RPMS internal interfaces. The previously separate OCE Directorates of Facilities Engineering and Military Construction have been consolidated. The planning and programming functions have been combined into a total Military Programs Directorate. This reorganization brings four of the five RPMS components under a single manager. (Disposal is not included in the reorganization).

- The Corps of Engineers division/district offices are being given an expanded role in RPMA support with the implementation of a "One-Stop" support concept. Under this concept, once the FE has received approval from his MACOM, he can, on a reimbursable basis, request his supporting district engineer to assist in resolving O&M problems. The district engineer is to attempt to solve the FE's problem using district resources and, if necessary, other resources (such as Corps laboratories, Facilities Engineering Support Agency, etc.) which have expertise in the problem areas. The "One-Stop" concept is to begin implementation in October, 1978 at installations supported by the Fort Worth and Omaha districts. The remainder of CONUS installations are to phase into the program by June, 1979.

RPMA resources are obtained and allocated through the Programming, Planning and Budgeting System (PPBS), which is a highly structured and complex process. The detailed description of this process is provided in Volume IV of the March, 1978 RPMA study report. Briefly, the system consists of three phases:

- Development of strategic multi-year plans detailing Army objectives.

- Preparation of programs for annual resource and performance requirements.

- Development of annual budgets for program accomplishment.

Installation RPMA requirements and MACOM requirement reviews, plus the prior year's program, form the basis for the RPMA budget estimate, which is a part of OMA Program 11. Program 11 contains consolidated Army requirements for BASOPS. Approximately 75% of all budgeted RPMA resources are obtained from the OMA appropriation enacted by Congress. Approved operating budgets are allocated to the field by the Controller of the Army through funding authorization documents.

The role of OCE in this process lies primarily in consolidation of requirements from the MACOM's and defending those requirements in budgetary requests.

Materiel Development and Readiness Command (DARCOM)

The U. S. Army Materiel Development and Readiness Command (DARCOM) consists of eight Research and Development Commands, five Materiel Readiness Commands, a Depot System Command, a Test and Evaluation Command, and several other supporting installations, including a Security Assistance Center.

DARCOM maintains a complex of industrial manufacturing and chemical plants, warehouses, research laboratories, and testing facilities to support its primary mission objectives, which are:

- Management of materiel activities of the Army.
- Army supply and maintenance support.
- Technical guidance for planning and logistics support.

Each of the 16 major subordinate commands (MSC's) within the DARCOM organization has an engineering staff that monitors RPMA activities at supported installations. These staffs perform primarily administrative engineering functions involving guidance, policy, and program and budget action. Technical engineering assistance and surveillance of DARCOM-wide RPMA activities are performed by the Installations and Services Agency (I&SA), which is located at Rock Island Arsenal, under the operational control of Headquarters DARCOM.

Organization

The basic staff organization for execution of RPMA at DARCOM installations is similar to that of FORSCOM and TRADOC. However, for depots, the FE reports to a director of services, not directly to the installation commander. At MSC's where only one installation is involved, the FE typically reports to the commander of the installation support agency which provides base operations support services to various weapons-system program directors.

Government-owned and contractor-operated (GOCO) ammunition plants are maintained by facilities support contractors whose activities are monitored and rated by a small resident in-house staff.

In many ways, GOCO plants and DARCOM Government-owned and Government-operated (GOGO) installations are regulated by two distinct sets of rules concerning RPMA. The most notable differences are the following:

- Contractors operating and maintaining production plants can more easily balance staffing with fluctuating work loads, since they are not constrained by the Army personnel system.

- GOCO plants are not as highly constrained by technical reporting requirements as are GOGO plants, since contractors charge the Government for all services performed, including submittal of reports.

- Contractors' profits are contractually tied to performance. Thus, there are profit incentives for efficient execution of production and maintenance operations.

- Facility operations and maintenance for active GOCO plants are typically combined with similar activities for production equipment under one directorate.

The execution of RPMA at GOGO installations is carried out through a facilities engineering directorate organized much like those of other MACOM's. A DARCOM installation FE does not have a separate supply function, but uses a consolidated installation supply system. Work is accomplished through use of in-house labor or contract services. Because of the greater complexity of DARCOM installations in comparison to the garrison-type facilities found in other MACOM's, in-house capability is retained for maintenance and repair of production facilities as well as for minor construction. Service contracts are used extensively for nonessential production-related activities such as custodial care, refuse collection, grounds maintenance, etc.

Funding and AIF

RPMA expenses for active facilities are financed by reimbursable orders through the Army Industrial Fund (AIF), Procurement Funds, and Research, Development, Test and Evaluation (RDT&E) appropriations. Unlike other MACOM's, DARCOM receives relatively small amounts of direct OMA dollars for RPMA expenses.

Over 60% of RPMA expenses for active facilities are processed through the AIF. This revolving fund is the vehicle for incorporating the cost of RPMA in the overhead rates for specific products or services performed by an installation. Overhead rates are applied to direct labor costs for production. Thus, the cost of RPMA and other BASOPS is passed on to the customer. At present, overhead rates exclude depreciation of facilities and equipment, military salaries, and Government-furnished supplies. Administrative tenants at AIF installations with a basic production mission, such as an arsenal, are provided with FE services through rental agreements which include utility costs, maintenance and repair costs, and other occupancy charges. These payments are made by the tenants to the installation revolving fund to cover support costs. In other cases, support is provided to tenants, who are billed for actual services, with the payment processed through the revolving fund.

In theory, AIF installations are to be self-sufficient in terms of financial support. Except for one-time capitalization requirements to initiate the fund, yearly operations including RPMA are to be reimbursed by customers using their various appropriations. This can be the case if the following factors are present:

- Facilities are in reasonably good condition upon startup of AIF operations.
- Facilities are fully utilized.
- Overhead rates can be applied for recovery of all support costs.

In reality, competitive pressure from industry and other DARCOM installations has tended to keep overhead rates as low as possible, to reduce end-product costs. To further compound the problem, many DARCOM facilities operate at less than full capacity, because of peacetime production requirements. Overhead rates cannot absorb the full costs for maintaining underutilized facilities on a reduced production basis while remaining reasonably competitive with the private sector. Because of these factors, projects for repairs and maintenance are often deferred. Historically, limited OMA funds are made available to AIF operations, although existing regulations (AR-37-110) provide the vehicle for financing underutilized production capacity. For these reasons, there are relatively large backlogs of maintenance at arsenals and depots.

GOCO Plants

Active GOCO plants are financed by procurement funds which are handled through the revolving AIF. All production and maintenance work is executed by contract.

At active plants, direct production and recurring operations and maintenance costs are paid for by customers. The modernization of plants, equipment replacement, and nonrecurring repair and maintenance projects at GOCO plants are provided by direct procurement funds from DARCOM.

All maintenance at inactive GOCO plants is accomplished by contract, but is directly funded by OMA.

RDT&E

Maintenance costs in support of DARCOM laboratories and development centers that are located at either DARCOM or other MACOM installations are reimbursed through host-tenant agreements. The cost of this support is included in overhead costs charged to R&D projects.

At testing facilities and proving grounds, the direct costs of FE activities are passed on to the test customers. Indirect costs are financed by direct funding.

DARCOM Resource Management

Because of its complex mission, DARCOM has developed an organization structured around specific programs. RPMA is considered as a support cost in specific programs which are managed by resource managers who defend budgets and control resources.

As a result, there is little visibility for total RPMA requirements, by specific account, in the DARCOM budgeting process. While this has not resulted in an optimum situation for RPMA, it has provided DARCOM with an overall system which has been effective in achieving its basic mission objectives.

Installations and Services Activity (I&SA)

DARCOM has 16 MSC's and more than 60 installations. Engineering expertise has been consolidated in the Installations and Services Activity at Rock Island, Illinois, which provides nonreimbursable support to all DARCOM installations. This agency has responsibility for assisting installations in the initial planning of projects involving major repair and maintenance and new construction. This assistance is provided to ensure that there is adequate liaison, in terms of concept design, between DARCOM installations and CE districts. Since nearly 90% of DARCOM's projects are unique, greater interface is required between installations and the CE districts. I&SA has been delegated the authority for technical approval of design criteria and concept design for major construction projects. Through reviews and field visits, the activity has reportedly achieved cost avoidance in excess of $40 million in a 15-month period.

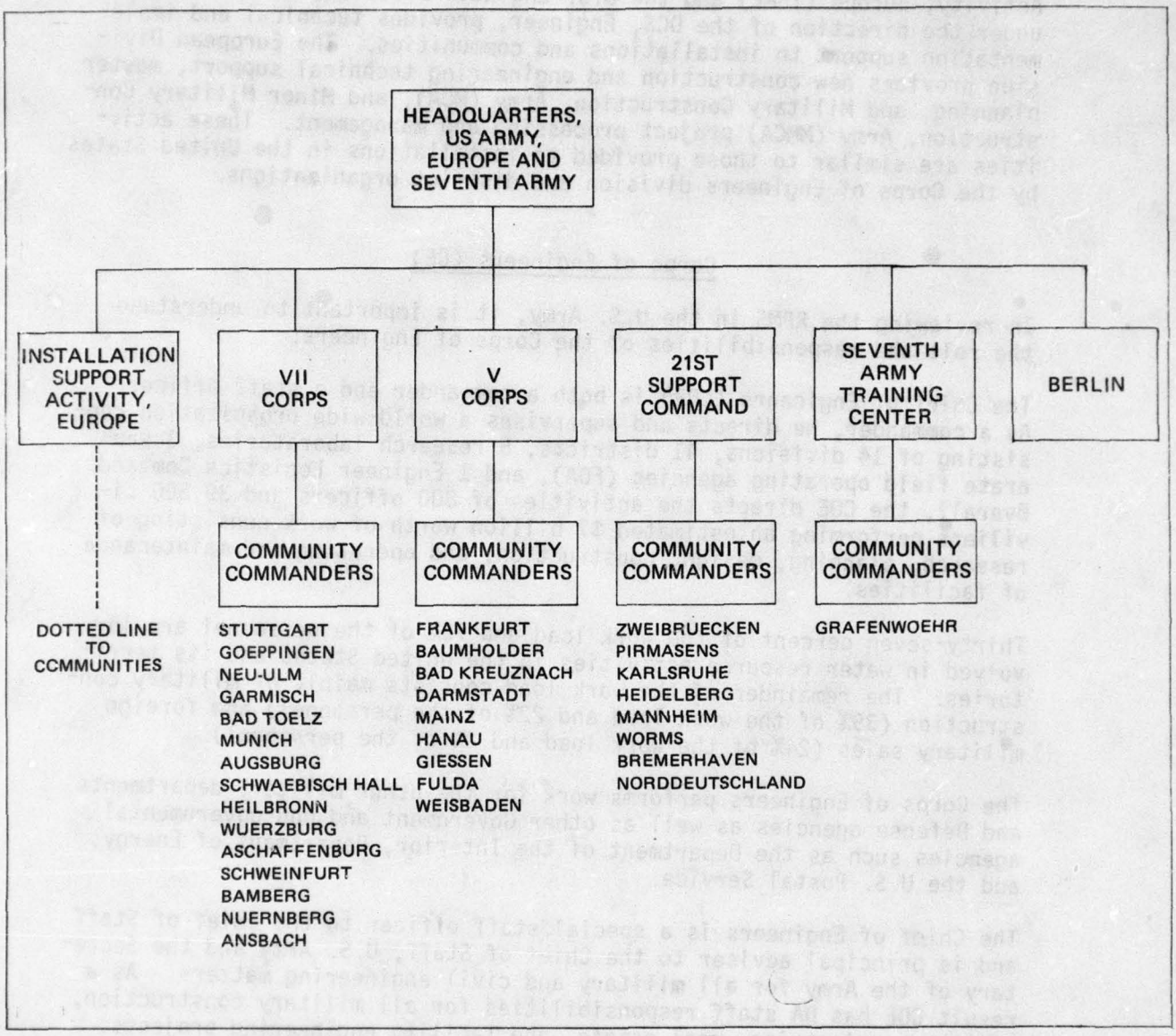
In addition, the I&SA is responsible for validation of BMAR, performance rating of FE operations, provision of technical engineering assistance, and review and consolidation of installation RPMA requirements.

United States Army, Europe (USAREUR)

The U.S. Army in Europe operates and maintains a total of nearly 800 installations in 34 communities in Germany. The major organizations responsible for these operations are the Headquarters, USAREUR; VII Corps; V Corps; 21st Support Command; Seventh Army Training Center; U.S. Army, Berlin; and community commanders. A simplified organization chart (Exhibit IV-2) shows the reporting relationship to the community level. The USAREUR system is also described in detail in Volume IV, Chapter 3 of the Phase I report.

USAREUR's RPMA organization is also decentralized, as are these activities in the rest of the Army. The primary engineering staff element in USAREUR that is responsible for this function is the Office of the Deputy Chief of Staff (DCS), Engineer. Each subordinate command (VII Corps, V Corps, 21st Support Command, Seventh Army Training Center,

USAREUR ORGANIZATION



SOURCE: USAREUR

and U.S. Army, Berlin), and installation has its own engineering staff to administer and control the engineering activities under its jurisdiction.

Two additional organizations provide engineering services to support the community facilities engineer. These are the Installation Support Activity, Europe (ISAE) and the U.S. Engineer Division, Europe. ISAE, under the direction of the DCS, Engineer, provides technical and implementation support to installations and communities. The European Division provides new construction and engineering technical support, master planning, and Military Construction, Army (MCA), and Minor Military Construction, Army (MMCA) project processing and management. These activities are similar to those provided to installations in the United States by the Corps of Engineers division and district organizations.

Corps of Engineers (CE)

In reviewing the RPMS in the U.S. Army, it is important to understand the role and responsibilities of the Corps of Engineers.

The Chief of Engineers (COE) is both a commander and a staff officer. As a commander, he directs and supervises a world-wide organization consisting of 14 divisions, 41 districts, 5 research laboratories, 3 separate field operating agencies (FOA), and 1 Engineer Logistics Command. Overall, the COE directs the activities of 800 officers and 39,500 civilians performing an estimated $7 billion worth of work consisting of research, planning, design, construction, and operation and maintenance of facilities.

Thirty-seven percent of the work load and 72% of the personnel are involved in water resource activities in the United States and its territories. The remainder of the work load consists mainly of military construction (39% of the work load and 22% of the personnel) and foreign military sales (24% of the work load and 2% of the personnel).

The Corps of Engineers performs work for the other military departments and Defense agencies as well as other Government and non-governmental agencies such as the Department of the Interior, Department of Energy, and the U.S. Postal Service.

The Chief of Engineers is a special staff officer to the Chief of Staff and is principal adviser to the Chief of Staff, U.S. Army and the Secretary of the Army for all military and civil engineering matters. As a result COE has DA staff responsibilities for all military construction, military engineering, real estate, and facility engineering projects. COE is the titular head of all military engineers, active and reserve, world-wide. The engineer group is divided as follows:

	Number of Personnel
Military Engineers:	
Active Army	43,000
Reserve Components	91,000
Facilities Engineering:	
Military	2,400
Civilian	48,600
Corps of Engineers Command:	
Military	800
Civilian	39,500
Grand Total	225,300

The Corps of Engineers field organization is managed and controlled by an integrated staff and command organization located in Washington, D.C. All laboratories and separate field operating agencies (FOA's) report to the OCE. The office is staffed with about 1,100 employees.

Directly under the Chief are 14 divisions or subordinate commands which perform the middle management function and command the 41 districts world-wide.

	No.	Military Construction (MC)	Civil Works (CW)	MC/CW
Divisions:	14			
CONUS	11	1	4	6
Overseas	3	2	0	1
Districts:	41			
CONUS	35	0	25	10
Overseas	6	5	0	1
Laboratories and Special Activities:	8			
Research Activities	5	0	1	4
Separate Field Operating Agencies	3	2	1	0

Divisions are of two main types - operating divisions (without districts) and standard divisions with two to five districts each. Division responsibilities (except Huntsville division) are geographic, depending on type of work program. Civil works responsibilities follow river drainage basins, whereas military construction responsibilities are generally organized with-

in state boundaries. The one functional division at Huntsville, Alabama performs specialized construction support such as the Production Base Support Program for DARCOM, Safeguard, and erection of bulk mail centers for the Postal Service, without regard to geographic boundaries.

Each of the 9 standard divisions has an integrated staff of about 256 personnel. Operating Divisions have a strength of from 276 to over 486 personnel each. Divisions may perform MC, CW, or both, depending on the missions assigned. Only about 10% of the Corps of Engineers personnel are assigned as overhead in OCE and the 14 divisions. The remainder are assigned to the districts, FOA's, and laboratories.

The 41 districts are the main operating elements for planning, design, construction, operation, and maintenance of facilities.

Districts are located in 30 of the 48 contiguous states. Each district has several area, resident, or project offices located throughout its area to supervise construction or to operate and maintain water resource related facilities. The Louisville District, for example, has 65 offices spread throughout Indiana, Kentucky, Illinois, and Ohio. The Corps of Engineers maintains one or more offices in each of the 50 states. The majority of the offices performing military construction supervision are located on active Army installations. Most of the field offices performing civil works activities are located in leased or Corps-owned facilities convenient to their work sites.

The size of the districts varies according to the work load assigned and the personnel complement fluctuates from year to year. Currently, the CONUS districts vary in size from 165 to over 1,800 personnel, with the average being 1,066. The estimated FY 78 total work load per district is $108.9 million, varying from a low of $24 million (Charleston) to a high of $341.8 million (Fort Worth).

Each operating district has all the staff needed for contracting, construction management, program planning, design, design reviews, budgeting, auditing, etc. Basically, the Corps of Engineers field agencies are primarily planning, design, and construction management organizations. Approximately 25% of military construction design and 75% of civil works design is done in-house, with the remainder awarded to architectural and engineering firms. Almost all construction is done by contractors through fixed price contracts.

The Corps has successfully operated a revolving fund in its water resource operations for many years. Most districts have a revolving fund section in the Office of the Comptroller to handle all actions affecting its use.

A functional breakdown of the 36 districts and the New England Division by functional skills is shown on Exhibit IV-3. The average district has those skills necessary to perform FE-type management and engineering functions. For example, 18 personnel are experienced in

FUNCTIONAL STRATIFICATION OF CORPS
36 DISTRICTS AND NED - 48 CONTIGUOUS STATES AND ALASKA

OFFICE FUNCTIONS	AVERAGE CORPS DISTRICT
I. PLANNING	(56)
*1. Planning and Reports	25
*2. Flood Plain/Urban Studies	13
*3. Environment & Studies	18
II. ENGINEERING	(156)
*1. Design/Technical Engineering	29
*2. Foundations & Materials	23
*3. Hydraulics/Hydrology	25
*4. Relocations	5
*5. Estimating & Specifications	9
*6. Survey	8
*7. Electrical/Mechanical	11
*8. General Engineering	15
*9. Drafting & Mapping	20
*10. Structural	11
III. CONSTRUCTION	(17)
*1. Contract Administration	9
*2. Supervision & Inspection	8
IV. OPERATIONS	(45)
*1. Hydro-Power	1
*2. Navigation	6
*3. Regulatory Functions	16
*4. Resource Management	5
*5. Plant & Maintenance	12
*6. Misc. Operations	5
V. REAL ESTATE	(21)
*1. Acquisitions	7
*2. Appraisals	3
*3. Management & Disposal	7
*4. Planning & Control	4
VI. FINANCIAL	(38)
1. Budget	5
2. Finance & Accounting	25
3. Audit	0
4. Management Analysis	2
5. Program Development	6
VII. ADMINISTRATIVE SERVICES	(141)
1. Secretarial	54
2. Reproduction	11
3. Mail & Records	9
4. General Services/Administration	19
5. Clerical	46
6. Library	2

OFFICE FUNCTIONS	AVERAGE CORPS DISTRICT
VIII. PERSONNEL	(13)
1. Recruiting & Placement	4
2. Position & Pay Management	2
3. Mgmt Employee Relations	3
4. Technical Services	2
5. Manpower Management	1
6. Training	1
IX. AUTOMATIC DATA PROCESSING	(11)
1. Systems & Programming	6
2. Computer Operations	5
X. PROCUREMENT & SUPPLY	(13)
1. Procurement	6
2. Supply	3
3. Contracts	4
*4. GFE Procurement	0
XI. MISCELLANEOUS	(32)
1. Counsel	7
2. Public Affairs	3
3. Safety	2
4. Security/Provost Marshal	1
5. Executive Office	1
6. Trainees	15
7. EEO	15
8. Engineer Inspector General	0
9. DCPA	2
FIELD FUNCTIONS	
XII. FIELD ENGINEERING	(36)
*1. Field Survey	20
*2. Testing/Exploration	13
*3. Field General Engineering	3
XIII. FIELD CONSTRUCTION	(60)
*1. Field Inspection	35
*2. Field Contract Administration	25
XIV. FIELD OPERATIONS	(370)
*1. Floating Operations	18
*2. Lock & Dams	65
*3. Field Power Operation	29
*4. Field Plant & Maintenance	60
*5. Field Resource Management	113
*6. Misc. Field Operations	46
*7. Dredging	37
*8. Regulatory Functions	2

OFFICE FUNCTIONS	AVERAGE CORPS DISTRICT
XV. FIELD REAL ESTATE	(5)
*1. Acquisition	5
*2. Appraisals	0
*3. Management & Disposal	0
*4. Planning & Control	0
XVI. FIELD SUPPORT	(52)
1. Field Secretarial/Typing	14
2. Field Administration Service	14
3. Field Financial	0
4. Field Personnel	0
5. Field Supply	2
6. Misc. Field Services	6
7. Field Trainees	2
8. Field Clerical	14
	523

Average Total Office & Field - 1066 per district
Source Date - Corps Stratification - Data as of 30 June 70

* - Mission Element

Average Ratio Mission to Support - $\frac{766}{300}$ = 2:55 ratio of mission to support

environmental studies, as well as 250 to 300 engineers, a comptroller's office with 38 personnel, 13 experienced contract administration personnel in construction type work, and 11 in data processing. The work force is classified approximately 77% general schedule (GS) and 23% wage board (WB).

The district office is the planning, design, support, management, and supervision element of the district, while the field elements oversee construction execution and the operation and maintenance of completed facilities. The field personnel administer and inspect contracts awarded by the district office. Those personnel involved in construction are quite mobile and move from one construction site to another as projects are initiated and completed. Operations and maintenance personnel, however, are relative immobile and are stationed at fixed Corps installations such as power plants, recreational lakes, locks, and dams, etc.

In almost all cases, field personnel are experienced contract administrators supervising all types of projects from custodial and refuse removal to grass mowing, timber cutting, or maintenance and repair activities.

Several districts maintain industrial repair shops capable of making specialized components for locks and dams, dredges, and miscellaneous equipment. Other specialized shops include printing, sign painting, heavy equipment repair, automotive repair, small boat repair, radio repair, and carpentry shops.

Division and district support to facilities engineers has been increasing in the past two years. In FY 77, over $67 million was expended world-wide in assisting FE's; of this $20.8 million of work was performed in Europe and the Pacific and $46.5 million in CONUS. Twelve districts participated in the support (11 military districts plus Wilmington). In FY 78, some $83.3 million of support has been rendered, of which $39.6 million was for overseas support.

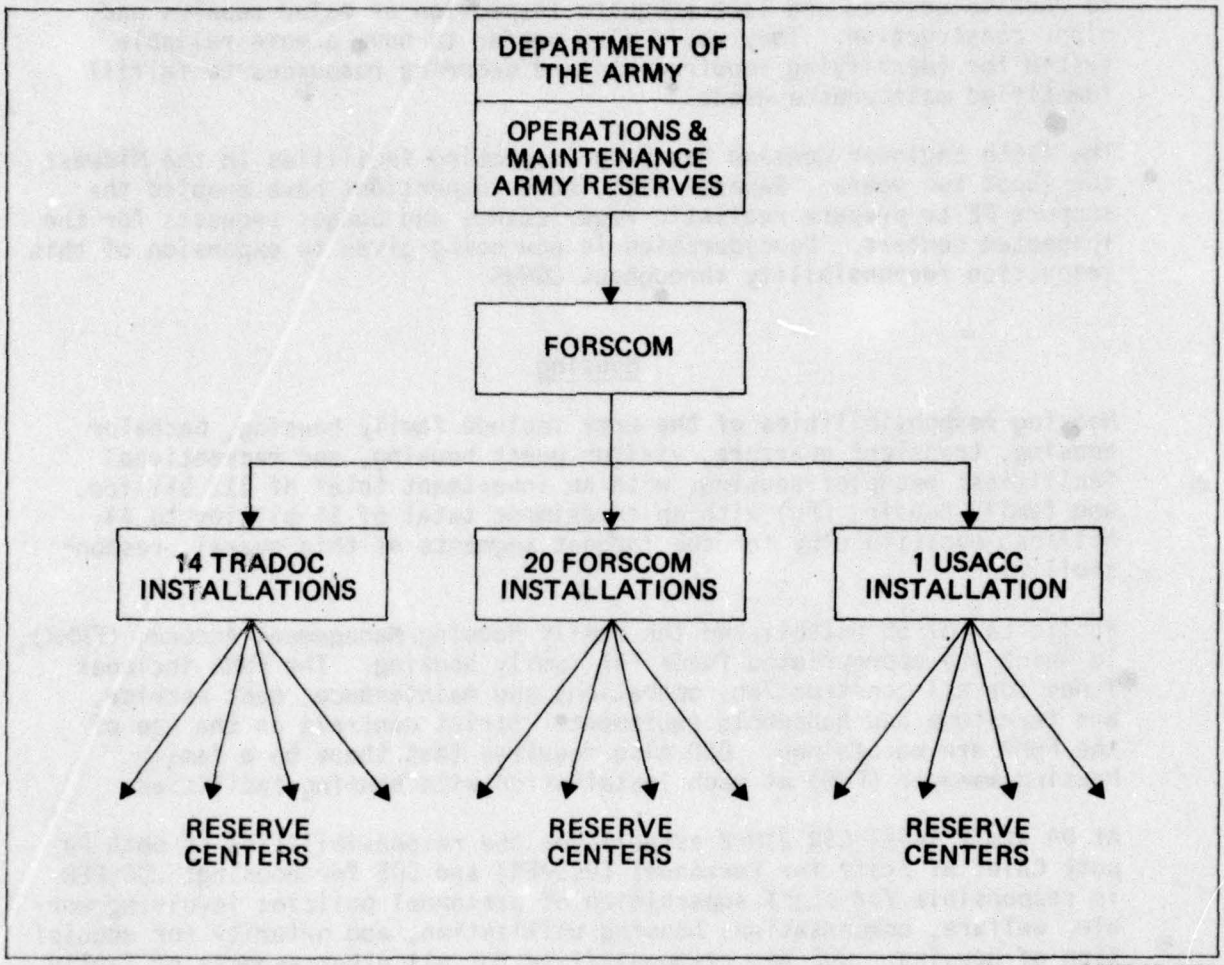
Reserve Centers

At the present time, well over 1,000 Army Reserve Centers receive RPMA support from some 35 Army installation FE's, including 20 FORSCOM FE's, 14 TRADOC FE's, and 1 United States Army Communications Command (USACC) FE.

All Operations and Maintenance Army Reserve (OMAR) funds are provided by or through one of these 35 support installations (Exhibit IV-4). The FE at each support installation requests funds from FORSCOM, regardless of the MACOM to which his installation reports. Because of the remoteness of many of the Reserve Centers from the support installation, the FE does not have firsthand familiarity with the maintenance needs of each center. As a result, his budget requests are normally

EXHIBIT IV-4

FLOW OF OMAR FUNDS TO RESERVE CENTERS



SOURCE: OCE

based on past trends and Reserve Center descriptions of problems, rather than on a comprehensive evaluation of each center's needs, particularly long-term preventive maintenance needs. Neither the Major United States Army Reserve Command (MUSARC) nor the Numbered Armies in the Continental United States have a significant role in budgeting or apportioning OMAR funds.

Reserve Center commanders generally believe their facilities are the last to receive service and lack adequate inspection of major repairs and minor construction. They would also prefer to have a more reliable system for identifying requirements and securing resources to fulfill identified maintenance needs.

The 416th Engineer Command has been inspecting facilities in the Midwest for about two years. Reports from these inspections have enabled the support FE to prepare realistic requirements and budget requests for the inspected centers. Consideration is now being given to expansion of this inspection responsibility throughout CONUS.

Housing

Housing responsibilities of the Army include family housing, bachelor housing, transient quarters, visitor guest housing, and recreational facilities; bachelor housing, with an investment total of $12 billion, and family housing (FH) with an investment total of $3 billion to $4 billion, constitute by far the largest segments of this overall responsibility.

Public Law 87-55 established the Family Housing Management Account (FHMA), to which are appropriated funds for family housing. The FHMA includes funds for all construction, operations and maintenance, debt service, and furniture and household equipment. Strict controls on the use of the FHMA are maintained. DOD also requires that there be a family housing manager (FHM) at each installation with housing facilities.

At DA staff level CSR 210-2 establishes the responsibilities of both Deputy Chief of Staff for Personnel (DCSPER) and COE for housing. DCSPER is responsible for staff supervision of personnel policies involving morale, welfare, compensation, housing utilization, and priority for acquisition of housing. COE has responsibility for all other aspects of family housing, including execution of activities, policies, objectives, criteria, standards, and design and construction of new housing and improvements.

During the past two decades, primary staff supervision responsibility for FH has been shifted from the Deputy Chief of Staff for Logistics (DCSLOG) to COE back to DCSLOG and back again to COE. The field has not uniformly followed this last staff shift, with the result that MACOM's and individual installations currently have FH under both functional groups. In USAREUR, family housing is under the Director of Engineering and Housing, who reports to the respective Community Com-

mander. Regardless of the organizational location, the FHM procures RPMA services from the installation FE. These services are paid for from the FHMA.

Funds for bachelor housing construction are provided by MCA, while bachelor housing RPMA is funded by OMA. The installation FE is responsible for planning, programming, budgeting, and executing RPMA for bachelor housing.

Consolidations

One of the principal thrusts in the past several years has been the emphasis on consolidation of real property maintenance activities at contiguous and nearby military installations. The DOD guidelines dated 1 June 1972 established the requirement for the Services to Consolidate RPMA at military installations within a 35-mile radius of a designated geographical point. The purpose of the consolidation effort is to achieve economies of operation while maintaining present levels of customer service and responsiveness.

To date, several consolidations have either been implemented or are under study for implementation. Two recent examples of consolidation efforts involving Army installations are SARPMA and the National Capital Region.

SARPMA, the San Antonio Real Property Maintenance Agency, is scheduled to become operational in FY 80. The consolidation involves five installations in the San Antonio, Texas Area. The installations are Fort Sam Houston, Brooks AFB, Kelly AFB, Lackland AFB, and Randolph AFB..

The organization structure proposed for SARPMA includes a centralized staff to perform the majority of the management and engineering functions for the five installations. In addition, central stops are to be established that will be responsible for accomplishing O&M tasks of a large and/or complex nature. At each installation, a Field Engineer is to be responsible for the performance of day-to-day O&M operations and services such as operating utility plants, grass cutting, etc., and for accomplishing minor maintenance and repair tasks.

The consolidated engineering organization is to report to the Air Training Command. To fund the organization, an industrial fund is to be established and customers are to reimburse the fund for all services received.

The cost and benefit analyses performed in the feasibility study indicated that net personnel space savings of 344, representing a 11.8% reduction, could be achieved through implementation of the proposed SARPMA organization.

A report on the feasibility of a National Capital Regional consolidation was issued in June, 1978 by the U.S. Army Engineer Studies Center. Included in this report is a recommendation for consolidation of the Real Property Maintenance Activities of Fort Belvoir, Vint Hill, Arlington Hall, Fort Myer, Fort McNair, Cameron Station, Harry Diamond Laboratories, Walter Reed Medical Center, and the Defense Mapping Agency - Topographic Center.

The proposed organization centralizes engineering management and administrative functions. The day-to-day execution of RPMA is to be performed by a labor force located at the installation. As with SARPMA, the National Capital Region consolidation is to be industrially funded.

The cost and benefit analyses of the proposed National Capital Region consolidation indicated that net personnel space savings of 113, representing a 7.0% reduction, could be achieved through the consolidation of the facilities engineering functions of the nine installations.

In these two consolidations, as with others, staff reductions result from the integration of overhead functions such as engineering plans and service, planning functions, and the common support services provided to the various installations. Additional cost reductions are often available through decreases in total equipment requirements, because of the greater utilization of maintenance and service equipment attainable by the consolidated organization.

Generally, consolidations are an effective method of achieving economies in RPMA. In practice, however, consolidations are difficult to establish, for a variety of reasons. Some of the most important obstacles to consolidations include the following:

- In consolidations that involve more than one Service, there are difficulties due to incompatability of operating systems. For example, in SARPMA, IFS and BEAMS (the respective Army and Air Force information systems) are not compatible.

- Commanders have been reluctant to give up such a major portion of their BASOPS responsibility.

- Efforts to consolidate are very time-consuming, because of the necessity of coordinating with a number of command elements. For example, in the National Capital Region consolidation, seven Army commands are involved.

Contracting

Most FE organizations utilize a substantial number of contracts for provision of RPMA services to the installation. Services typically contracted-out include custodial service, refuse collection, painting, and

maintenance and repair of elevators and air conditioning units, along with numerous other activities which are detailed in the Phase I study report. Increased reliance on contract services has been caused by static personnel resources and expanding work loads which have dictated the use of outside contractors to accomplish on-going requirements.

Currently, many FE organizations do not have adequate staff for specification writing and inspection of contractor work. Although broad guidelines from DA are provided to the FE on contract specifications, substantial effort by the FE staff is required to write the detailed specifications required for contract solicitations.

Because of impending reductions in RPMA personnel levels, increasing emphasis is placed on contracting for services. Several contracting initiatives are currently underway. These include:

- The Corps of Engineers intends to provide policy guidance regarding contracting-out of specific functions. This guidance is to take the form of (1) identification of functions suitable for contracting; and (2) the development of guide specifications to help standardize contracting.

- Total contracting of family housing maintenance is to be tested in FY 80.

- Installations for testing of total BASOPS contracting have been identified.

The present ACMS inhibits consideration of regional contracting, since installations of various MACOM's are involved. Since each contract currently awarded through the individual installation procurement office requires substantial administrative effort in preparation, selection, and award, regardless of the contract value, potential economies provided by regional contracting are not being realized. Because of the increasing trend toward use of contract services, all possible means of achieving flexibility and economy should be considered.

Integrated Facility System (IFS)

The IFS is being installed to provide computer access to facility information regarding facility condition, capacity, utilization, ownership/control, and costs of investment and operation. All classes of facilities, including housing units, are included in the system. In addition, the system is to have the capability to relate facility data to specific mission or organizational plans. A major long-range goal of the system is to provide at the DA level management information relating to facility condition by facility class. It is intended that these data are to be used in the planning and budgeting of RPMA requirements. At the installation level, the system is to support such functions as facilities requirements planning; programming antiquated facilities for replacement

or disposal; the development of accurate cost data for preparing budget data; the development of unit costs and performance measures; and planning and scheduling work orders. The system is to provide for the use of a consistent reporting system for all MACOM's using common data elements.

The system has been under development for almost 12 years and is presently being implemented at FORSCOM and TRADOC installations. Because of conflicts with IFS system coding structures and those of existing DARCOM systems, implementation of IFS is not expected to be completed in DARCOM until early 1981.

The system provides weekly, monthly, quarterly, and annual reports concerning asset accounting and real property maintenance activities. Such reports include inspection requirements, status of special projects, work order status, in-house design project status, contract status, shop scheduling information, and functional cost data. Many of the weekly RPMA reports are distributed no higher than the installation level. Monthly, quarterly, and annual summary reports are distributed to MACOM's and DA headquarters.

Although there is a definite need for a management information system, there is some question as to whether the IFS will adequately fulfill that need. After almost 12 years an expenditure of $37 million, the Army still does not have a system capable of providing top management with the data necessary to evaluate RPMA performance.

In its current form, the complexity of the system's data requirements and the voluminous reports that are being produced are proving a burden rather than an aid to an already burdened FE staff. DARCOM has estimated that implementation of IFS will require an additional 94 planners/estimators and data transcribers in its various installations to handle the additional work load of IFS. In cases where facilities engineering organizations are being consolidated among several multi-service installations such as SARPMA, integration of IFS with existing information systems (e.g., BEAMS) has presented problems because of incompatibilities in data requirements, coding structures, and so on.

Although IFS is still a "young system," not yet operational, and is going through a debugging stage, a top level review is required now to attempt to increase the value of the system to all users by eliminating some reports, reformatting others, and increasing the system's capability to report on an exception basis.

V. REAL PROPERTY OPERATIONS AND MAINTENANCE IN THE NAVY, AIR FORCE, AND FEDERAL AGENCIES

V. REAL PROPERTY OPERATIONS AND MAINTENANCE IN THE NAVY, AIR FORCE, AND FEDERAL AGENCIES

A major task in the analysis of alternatives for the management of the Army's real property function was the review of systems and procedures employed by the Navy, Air Force, and other Federal agencies. The review and analyses documented in the Phase I study report provided the initial background data for this task.

Presented in this section of the report is an overview of each system and identification of specific features of each that are of significance in considering alternatives to the Army's RPMA system.

An indication of the relative scale of RPMA work among the three military services is shown in Exhibit V-1, following this page.

Navy

In the Navy as in the Army, RPMA at the installation level is the responsibility of the installation commander. The Navy, however, unlike the Army, includes transportation within RPMA.

The Navy utilizes two basic organization structures for executing RPMA. At independent Navy installations, the usual organization unit is a Public Works Department headed by a Public Works Officer (PWO), under the direction of the installation commander (see Exhibit V-2). This organization is similar to the typical Army organization, which normally has the facilities engineer (FE) reporting to the installation commander.

As indicated in Exhibit V-3, the installation commander reports to a major claimant (e.g., CINCLANFLT, CINPACFLT, etc.), equivalent to an Army major command (MACOM), which in turn reports to the Chief of Naval Operations (CNO).

The Naval Facilities Engineering Command (NAVFAC) is one of the five system commands reporting to the Naval Materiel Command (NAVMAT). NAVFAC provides advice and staff assistance to higher commands and advice and technical guidance to major claimants and installations. It accomplishes this latter function through six geographic Engineering Field Divisions (EFD), which compare with the Corps of Engineers' geographic divisions/districts.

Because the Navy has a large number of installations clustered around its major locations, it has developed a second basic organization concept for facilities engineering, the Public Works Center (PWC). As shown in Exhibit V-4, the center is a separate organizational entity reporting to NAVFAC. The Navy has had a long history of using Public Works Centers. There are currently nine centers in operation (see Exhibit V-5) with the oldest having been established in 1948.

EXHIBIT V-1

SCALE OF RPMA PROGRAM OF THE MILITARY SERVICES*

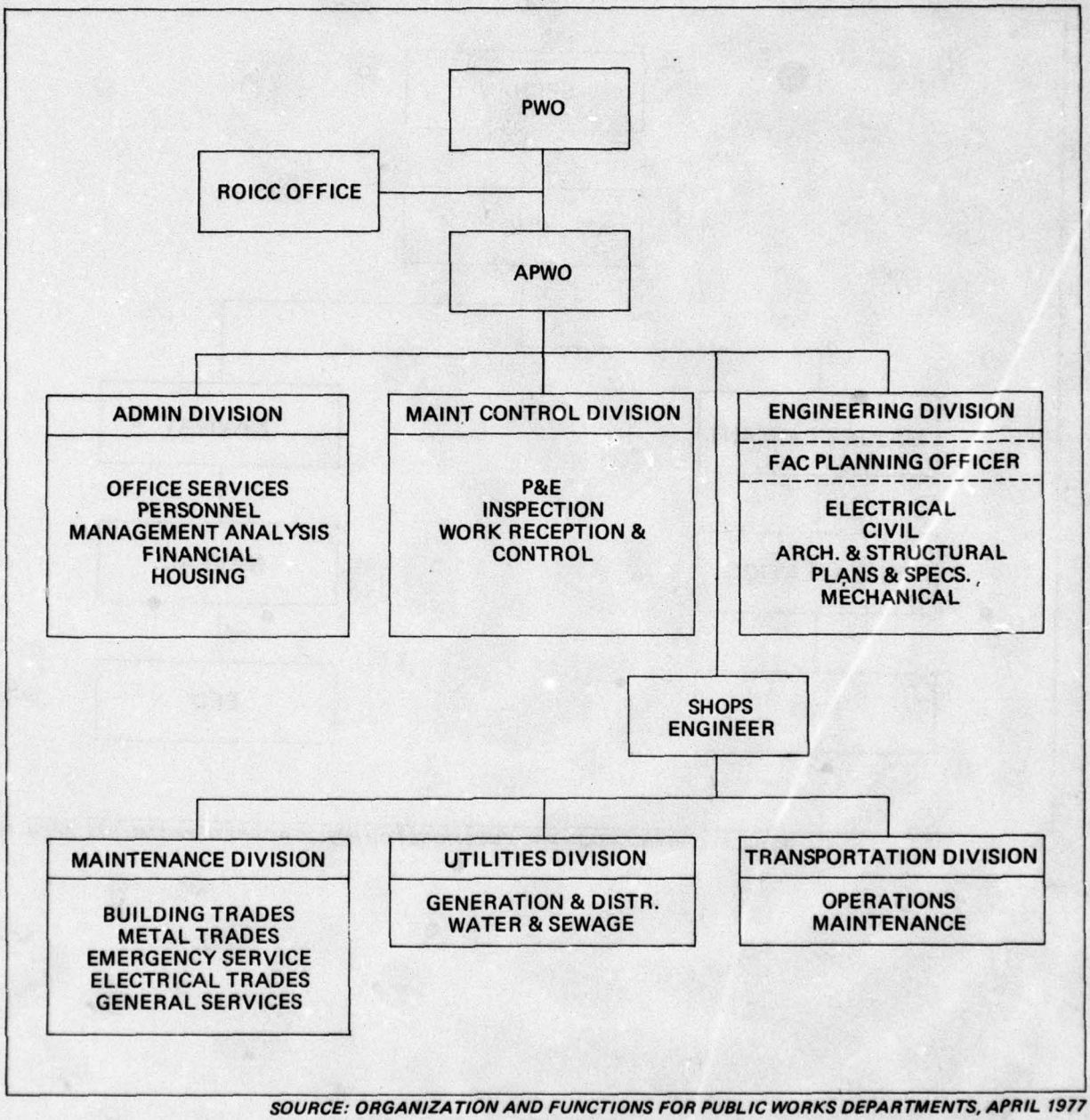
	Army	Navy	Air Force
RPMA			
Personnel	50,000	30,000 (est.)	59,000
Expenditures	$1.7 billion	$1.0 billion (est.)	$1.5 billion
Replacement Cost	$80 billion	$55 billion (est.)	$57 billion
BMAR	$1.2 billion	$0.5 billion**	n.a.

*1976 FY Data except as otherwise indicated
**1977 FY

SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT V-2

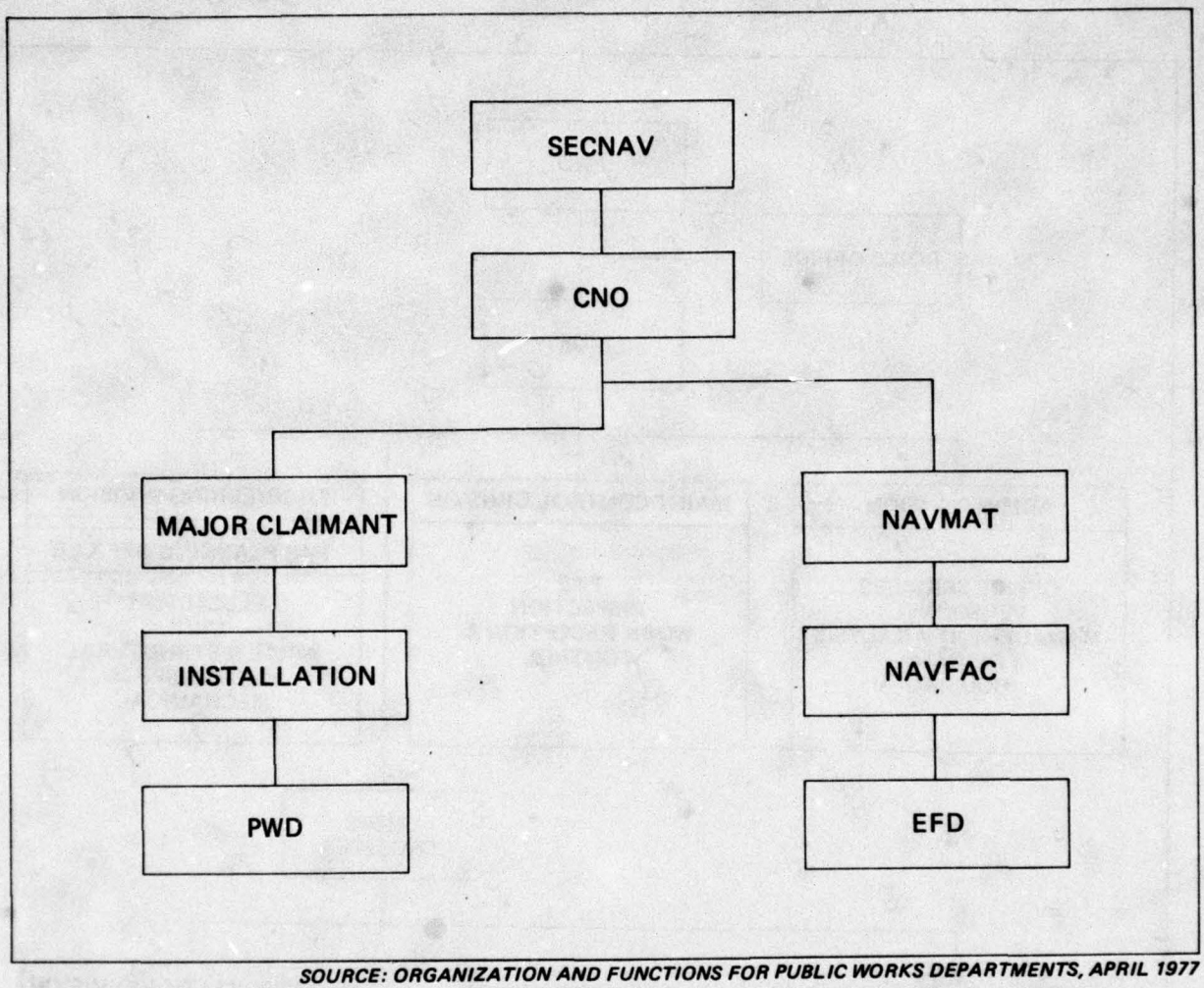
TYPICAL NAVY PUBLIC WORKS DEPARTMENT



SOURCE: ORGANIZATION AND FUNCTIONS FOR PUBLIC WORKS DEPARTMENTS, APRIL 1977

EXHIBIT V-3

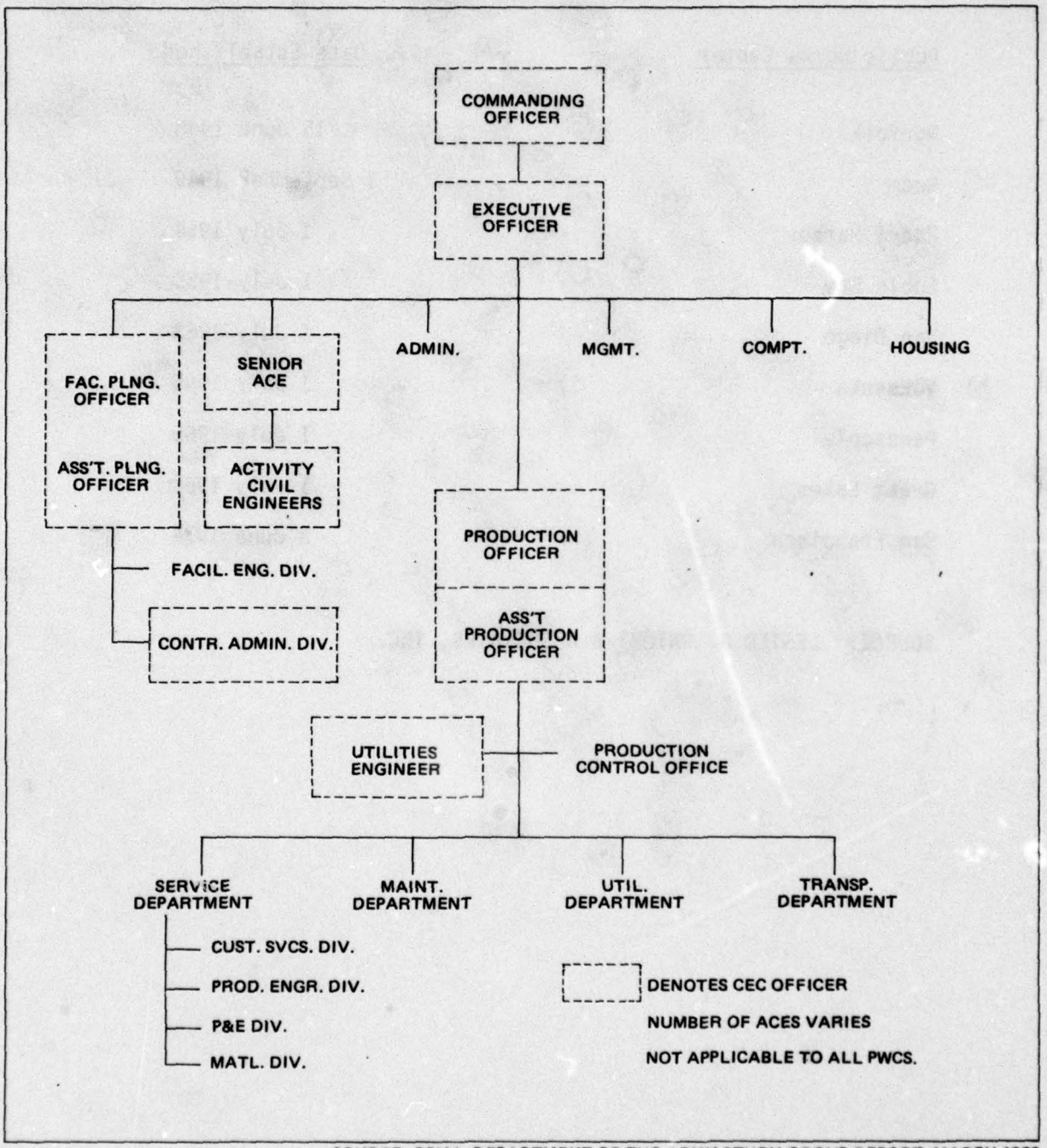
POSITION OF PUBLIC WORKS DEPARTMENT IN NAVY FACILITIES ENGINEERING ORGANIZATION



SOURCE: ORGANIZATION AND FUNCTIONS FOR PUBLIC WORKS DEPARTMENTS, APRIL 1977

EXHIBIT V-4

TYPICAL NAVY PUBLIC WORKS CENTER



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

Exhibit V-5

NAVY PUBLIC WORKS CENTERS

Public Works Center	Date Established
Norfolk	15 June 1948
Guam	1 September 1949
Pearl Harbor	1 July 1954
Subic Bay	1 July 1955
San Diego	1 July 1963
Yokosuka	1 July 1965
Pensacola	1 July 1965
Great Lakes	1 July 1965
San Francisco	3 June 1974

SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

A Public Works Center executes RPMA for all participant installations through an industrial fund arrangement. In effect, the center is a service agency providing real property management services, with participant installations treated as customers billed for the services performed. The center is expected to recover full costs through provision of its services.

The installation commander is responsible for planning, programming, and budgeting for his needs. These requirements are submitted through his major claimant. Funds are then allocated downward through the major claimants to the installations. Facilities engineering personnel, however, are responsible to the independent commanding officer of the PWC. In effect, the installation commander remains responsible for planning, programming, and budgeting for facilities engineering, but utilizes the PWC for execution of such work.

The PWC is the owner-operator of common use facilities, such as utilities and streets. Costs for the maintenance of these facilities are pro-rated to the various users. The PWC location in the Navy facilities engineering organization is shown in Exhibit V-6.

The Navy has pioneered in the use of engineered performance standards and is now the leading DOD agency in their application. Field activity managers utilize a variety of maintenance management control indices to indicate trends in RPMA. Exhibit V-7 presents an example of these indices.

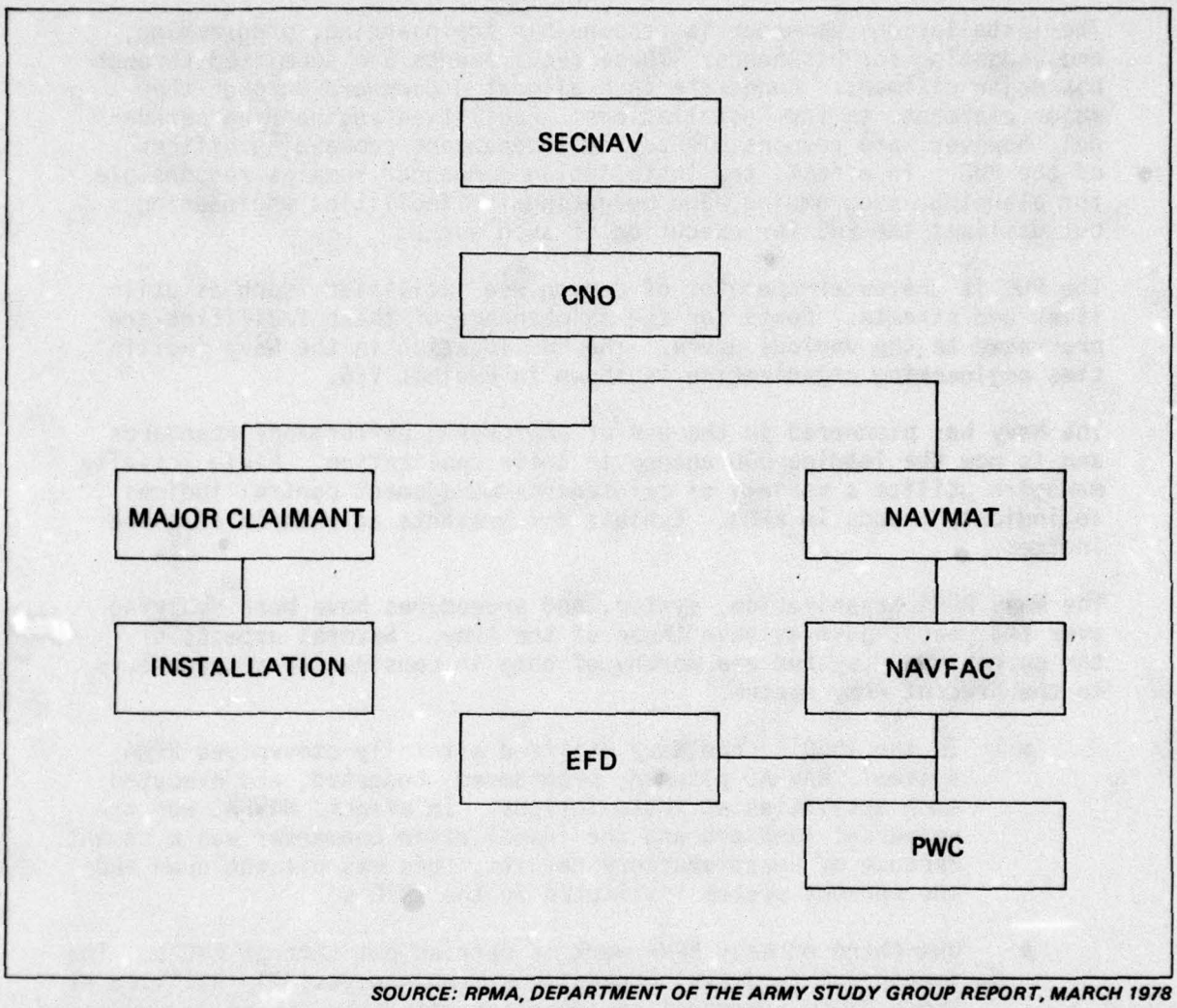
The Navy RPMA organization, system, and procedures have been evolving over the years, just as have those of the Army. Several aspects of the current Navy system are worthy of note in considering alternatives to the present Army system.

- In the 1960's, the Navy utilized a totally stovepiped RPMA system. NAVFAC planned, programmed, budgeted, and executed such activities at installations. In effect, NAVFAC was the universal landlord and the installation commander was a tenant. Because of unsatisfactory results, this was discontinued and the current system instituted in the 1970's.

- One-third of Navy RPMA work is carried out through PWC's. The industrial fund (IF) concept has been successfully utilized at those PWC's. General satisfaction with this system is expressed by installations, centers, and support agencies. Reportedly, the Navy has experienced a 10% reduction in discretionary-type requirements once the full cost of services is identified. General Accounting Office performance audits of the PWC-industrial fund system indicate that it is a desirable concept and is appropriate where it has been instituted. The installation commander's ability to carry out his mission has not been compromised, and the cost-consciousness that the industrial fund promotes is desirable. Preservation of assets, particularly utilities, receives increased attention.

EXHIBIT V-6

POSITION OF PUBLIC WORKS CENTER IN NAVY FACILITIES ENGINEERING ORGANIZATION



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT V-7

MAINTENANCE MANAGEMENT CONTROL INDICES

Maintenance Control	Actual FY___	Actual FY___	Target
Work generated by Continuous Inspection (%)			65
EPS Utilization (%)			
Emergency/Service (E/S Work (%))			7.5-11.5
Dynamic Equipment Inspection/Service (%)			1.5-3.0
Standing Job Orders (%)			20-30
Amount of Controlled Work (%)			80-85
BMAR ($000)			
Contract vs in-house (dollars)			
Number of items on-hand, not in process (work requests, inspection reports)			

Maintenance _____	Actual FY___	Actual FY___	Target
Division Overhead (%)			28-32
Shop forces backlog (months)			6 mos.±25%
E/S average time per work authorization			
E/S average response time			
Labor/Material Ratio			

SOURCE: MAINTENANCE MANAGEMENT OF PUBLIC WORKS AND PUBLIC UTILITIES, NAVFAC, NOVEMBER 1975

- The Navy has no counterpart to the Corps of Engineers' Civil Works responsibility. As a result, a higher percentage of Navy Civil Engineering Corps personnel are directly engaged in public works operations.

- NAVFAC, which plans, programs, budgets, and executes military construction, provides opportunities for close association with PWO's by utilizing PWO's as resident officers-in-charge of construction for local supervision of contract construction activities. This continuing contact between the EFD and PWO tends to build confidence in and familiarity with the services that the EFD is capable of providing. Knowledge of the skills and availability of these centralized engineering pools encourage the best use of these limited resources.

- Master planning is centralized in NAVFAC. Better use of specialized skills in these technical fields is achieved by centralizing them in EFD, rather than diluting them across many installations. Understanding of alternative long-term uses of various installations is greater at higher levels. Such broad understanding, rather than the short-term considerations of a transient installation commander, should predominate in master planning.

- General responsibility for accomplishment of the Navy-wide Pollution Abatement Program has been centralized at NAVFAC. Approved funding is assigned for apportionment by NAVFAC and the EFD's. Greater technical expertise can be brought to bear on these programs when responsibility is centralized at NAVFAC rather than assigned to individual installations.

- The Navy utilizes investment categories to stratify RPMA requirements. Examination of the relative conditions of various types of facilities, and the backlog of repairs and maintenance for each, enables senior decision-makers to allocate resources for best achieving objectives. This technique seems to be effective in presenting its BMAR reduction program to higher levels.

- The Navy "M" account, equivalent to the Army "K" account, Maintenance and Repair, is subdivided into M-1, Recurring and M-2, Major Maintenance and Repairs. (M-1 totals about twice as much as M-2.) M-2 consists of projects whose dollar value requires approval by higher authority. M-1 funds are controlled by major claimants, who balance relative needs of all their installations. M-2 projects are usually designed by EFD's or architects/engineers (A/E's). Design costs are normally paid by the installation.

- An Annual Inspection Summary (AIS) is prepared for each Naval installation by either the EFD or the PWC. The comparative value of "a single pair of eyes" performing this inspection helps ensure consistent interpretation of deficiencies. This work is directly funded and is not "charged back" to the installation. The installation uses the AIS to prepare its annual BMAR. Only projects that are critical and whose costs exceed $1,000 are included in BMAR. This method seems to produce a more consistent interpretation of BMAR definitions and thus a more credible BMAR.

- A public works center provides an installation with an easier means of obligating year-end funds than using contracting with outside sources. When an installation contracts with the PWC for a project, the funds are obligated.

- When installation commanders whose previous experience has been exclusively with the Public Works Department (PWD) are transferred to an installation serviced by a PWC, they initially tend to criticize PWC overhead rates. Having "one's own" PWD tends to obscure actual costs in general and overhead costs in particular. The cost-consciousness usually experienced by the installation commander at a PWC is desirable and encourages closer evaluation of projects. The same challenging of "rates" also affects the cost-consciousness of the PWC. It is a constant reminder encouraging effective use of manpower and materials to perform the work.

- The EFD performs a facilities management evaluation review at installations throughout the year. The review includes evaluation of the status of the facilities management program, assessment of conditions and resource requirements, and identification of any special problem areas.

- The Navy has a single industrial fund which serves as the central pool for all IF activities such as PWC's, Naval Air Rework Facilities, shipyards, laboratories, etc. Within the single fund are subaccounts for each individually created fund. Because cash flow cycles vary by subaccount, the single-fund concept requires a smaller total "pool" of money. The single fund serves as a central bank for all participants.

- At industrially funded Navy Public Works Centers, the PWO is the "owner" of the utility system. If major repairs, maintenance, or alterations are required to restore or maintain plant or equipment to such condition that it may be effectively utilized, those costs can be absorbed by the IF and recovered through the utility rate structure. This enables the PWO to undertake necessary major maintenance projects on a cyclical basis and maintain the system at a relatively high level.

If it becomes necessary to add capacity to or improve the system, the PWO, as the owner-operator, presents these needs upward through the Engineer Command to NAVFAC. Resources to accomplish such capital improvements ultimately come to the PWC as appropriated funds.

This system allows the PWO to manage his utility system in a more intensive way and to minimize utility system maintenance backlog.

Air Force

At Air Force installations, real property management is under the direction of the base civil engineer (BCE), who reports to the base commander, as shown in Exhibit V-8. Thus, the organization and command structure is similar to that of the Army. As in the Navy system, the Air Force BCE is also responsible for management of family housing.

At Air Force staff level, facilities management is the responsibility of the Director of Engineering and Services, who reports to the Deputy Chief of Staff for Programs and Resources, as shown in Exhibit V-9. The major command (MAJCOM) engineering organization is similar to that of Army MACOM's, as indicated in Exhibit V-10.

Aspects of the Air Force system which are of particular interest include the following:

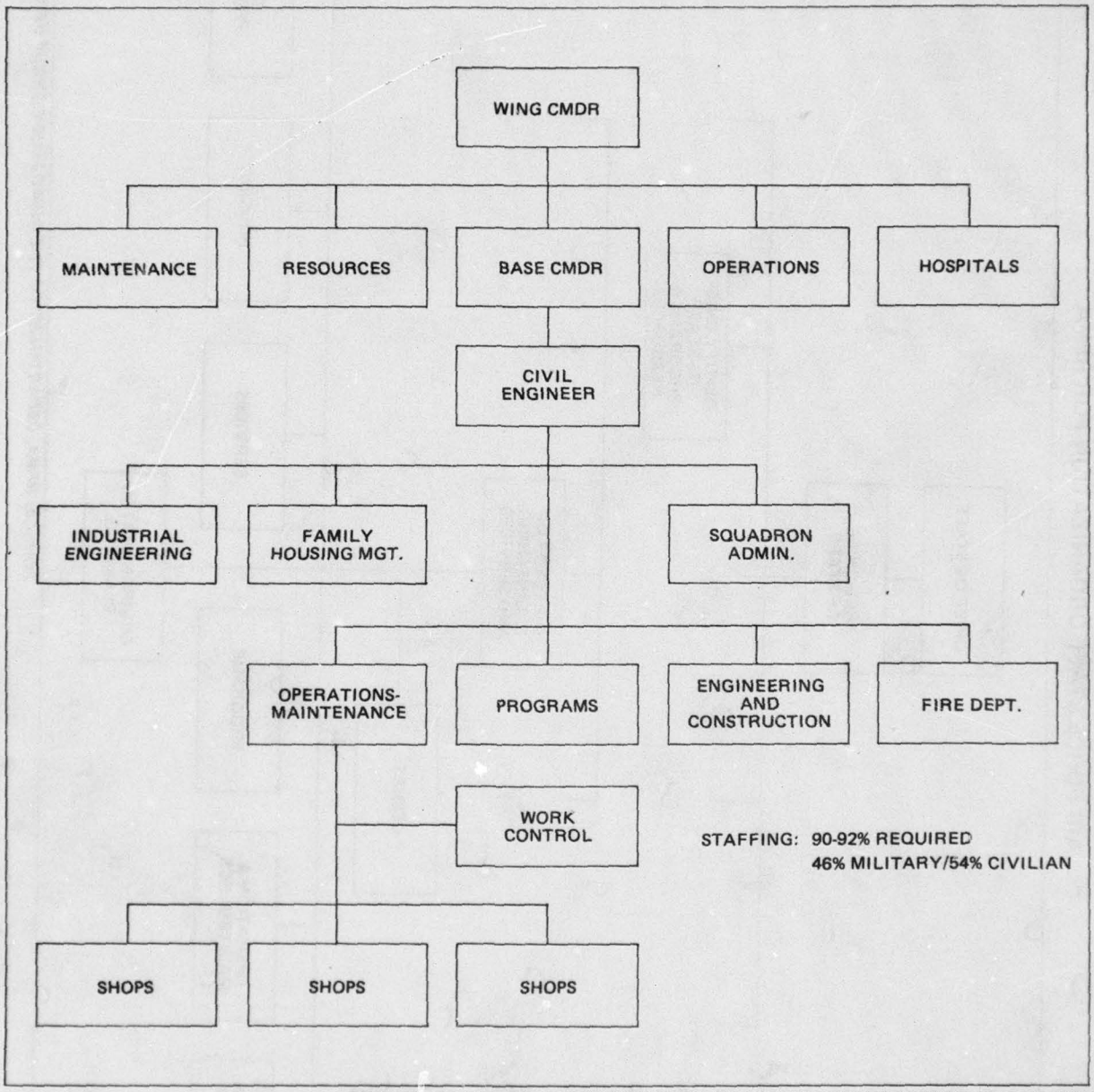
- The Air Force real property management staff includes a much higher percentage of military personnel than do the Army or Navy staffs. The Air Force Prime Base Engineer Emergency Force (PRIME BEEF) program is based on the need for rapid deployment in the event of emergency. The Air Force envisions military personnel engaged in facility maintenance activities as being quickly available for service wherever needed.

- At both staff and MAJCOM levels, the Engineering and Services (E&S) group is responsible for a broader scope of work than the BCE. In addition to property management activities, E&S at these levels is also responsible for such other BASOPS as commissaries, food services, cemeteries, mortuaries, laundries, and schools for dependents.

- The Air Force has developed a system for maintenance, repair, and minor construction (MAREMIC) projects which are to be undertaken by contract. The MAREMIC program is developed by the MAJCOM Deputy Chief of Staff for Engineering and Services. Funds for these contracts, when available, are held by the MAJCOM and are allocated to the BCE on a project-by-project basis.

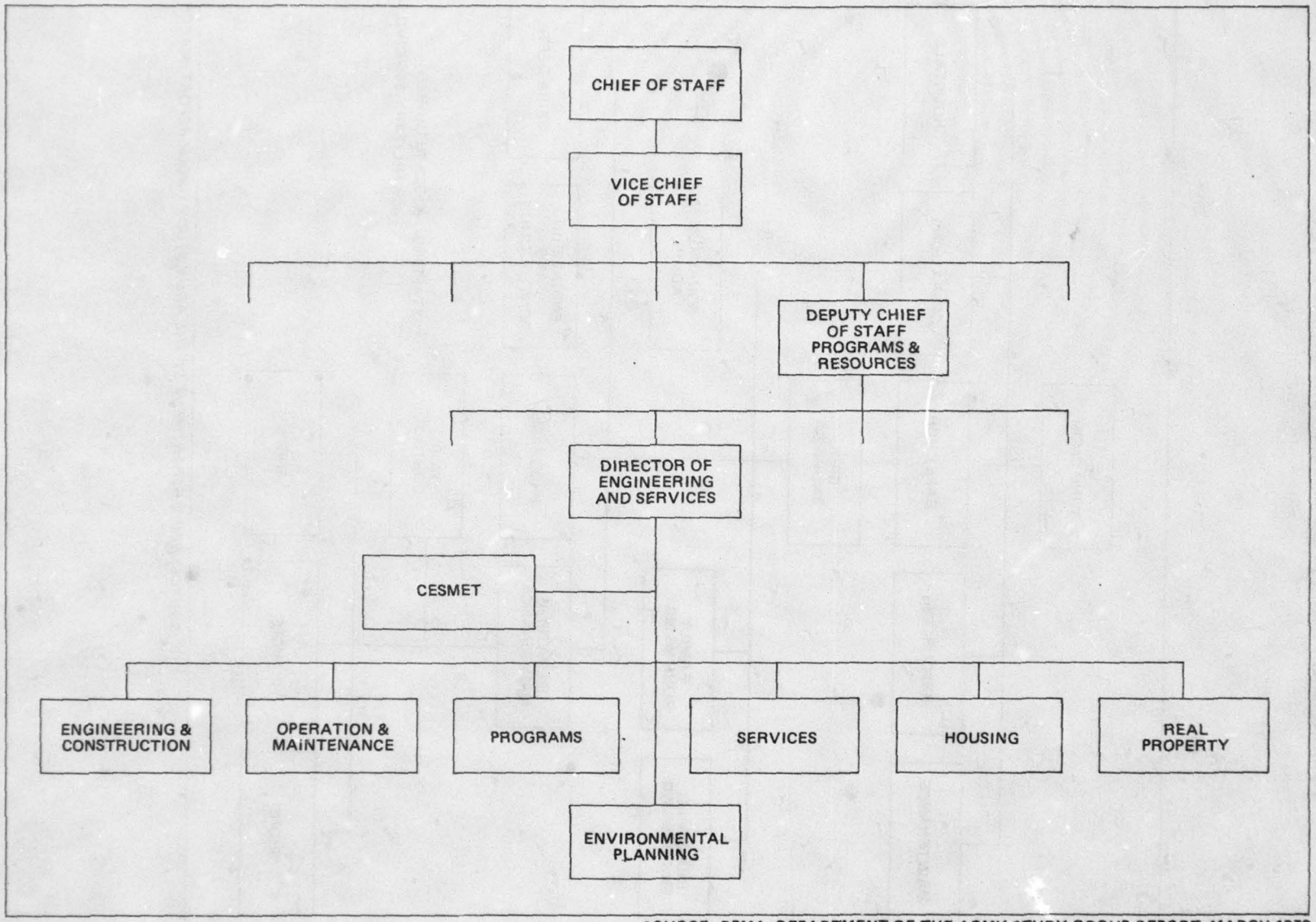
EXHIBIT V-8

TYPICAL AIR FORCE BASE CIVIL ENGINEERING DEPARTMENT



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

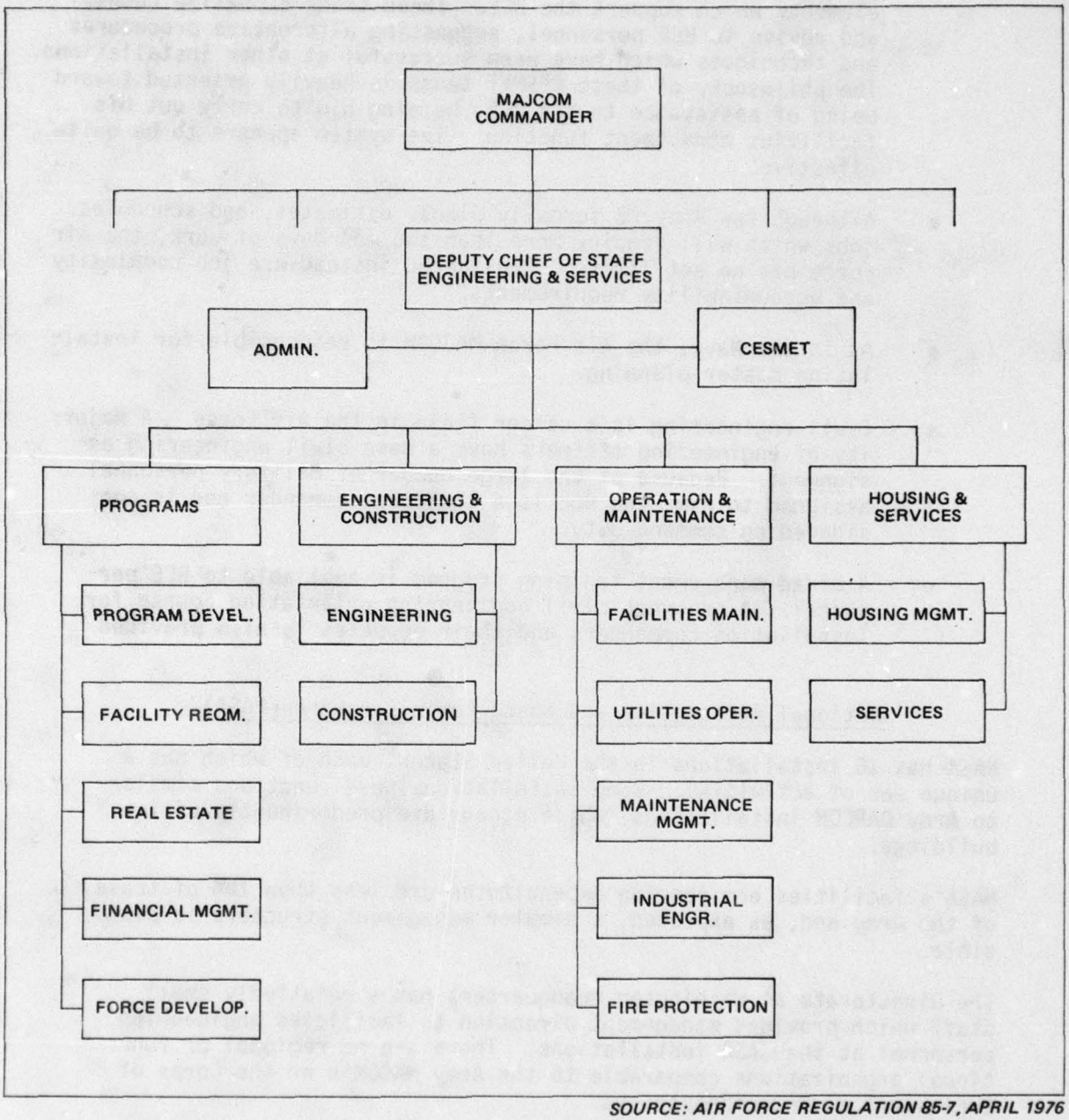
AIR FORCE STAFF ORGANIZATION FOR RPMA



SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

EXHIBIT V-9

TYPICAL AIR FORCE MAJCOM ENGINEERING AND SERVICES ORGANIZATION



SOURCE: AIR FORCE REGULATION 85-7, APRIL 1976

- The Army provides for a higher project approval level at the installation than does the Air Force. Greater control is retained by Air Force MAJCOM. (see Exhibit V-11).

- Both the MAJCOM and Air Force staff utilize handpicked Civil Engineering and Services Management Evaluation Teams (CESMET) to evaluate BCE performance as well as that of installation elements which support the BCE. These teams emphasize counsel and advice to BCE personnel, suggesting alternative procedures and techniques which have been successful at other installations. The philosophy of these CESMET teams is heavily oriented toward being of assistance to the BCE, helping him to carry out his facilities management function. The system appears to be quite effective.

- Although the Army FE formally plans, estimates, and schedules jobs which will require more than two man-days of work, the Air Force has no set limits. Considered instead are job complexity and accountability requirements.

- As in the Navy, the Air Force MAJCOM is responsible for installation master planning.

- Civil engineering is a career field in the Air Force. A majority of engineering officers have a base civil engineering assignment. Because of the large number of military personnel assigned to him, the BCE is a squadron commander and is considered on command duty.

- A broad management training program is available to BCE personnel. A one-week civil engineering orientation course for installation commanders and their deputies is also provided.

National Aeronautics and Space Administration (NASA)

NASA has 16 installations in the United States, each of which has a unique set of activities. Some installations have functions similar to Army DARCOM installations, while others are predominantly office buildings.

NASA's facilities engineering expenditures are less than 10% of those of the Army and, as expected, a simpler management structure is possible.

The Directorate at Washington headquarters has a relatively small staff which provides management direction to facilities engineering personnel at the NASA installations. There are no regional or functional organizations comparable to the Army MACOM's or the Corps of Engineers' divisions/districts.

EXHIBIT V-11

APPROPRIATED FUND PROJECT APPROVAL LEVELS ("Typical" at Installation Level)

	Installation		Major Command		Headquarters	
	Army	AF	Army	AF	Army	AF
Maintenance	$400,000	$100,000 (in-house) $0 (contract)	$400,000	$500,000	Unlimited	
Repair	$400,000	$50,000 (in-house) $0 (contract)	$400,000	$200,000	Unlimited	
Minor Construction	$50,000-$75,000	$10,000 (in-house) $0 (contract)	$75,000	$75,000	$200,000	$200,000

SOURCE: RPMA, DEPARTMENT OF THE ARMY STUDY GROUP REPORT, MARCH 1978

NASA's Washington headquarters consolidates budgets, approves new construction and major maintenance work, provides advice on environmental and energy issues, provides training, makes statistical comparisons, and undertakes liaison with other Federal agencies. Exhibit V-12 depicts a typical facilities engineering organization at a major NASA installation.

The NASA philosophy for facilities engineering is reliance on competent managers to perform quality maintenance. NASA has not issued a large volume of regulations.

NASA utilizes both in-house maintenance personnel and service contracts for real property maintenance activities. Reductions in force have caused NASA installations to increase service contract work in recent years. Inter-Service Support Agreements exist in several installations adjoining military facilities.

NASA has a series of approval controls which limit the facilities work that can be done without the approval of NASA headquarters. These controls have lower dollar limits than those of the Army.

Since there is no pool of facilities engineering skills at NASA headquarters (or a MACOM equivalent), engineering design support is provided primarily through A/E contracts.

NASA does not have a program equivalent to BMAR, relying for the most part on A/E reports to document specific needs. Maintenance is so obviously related to mission that maintenance does not tend to be neglected.

General Services Administration (GSA)

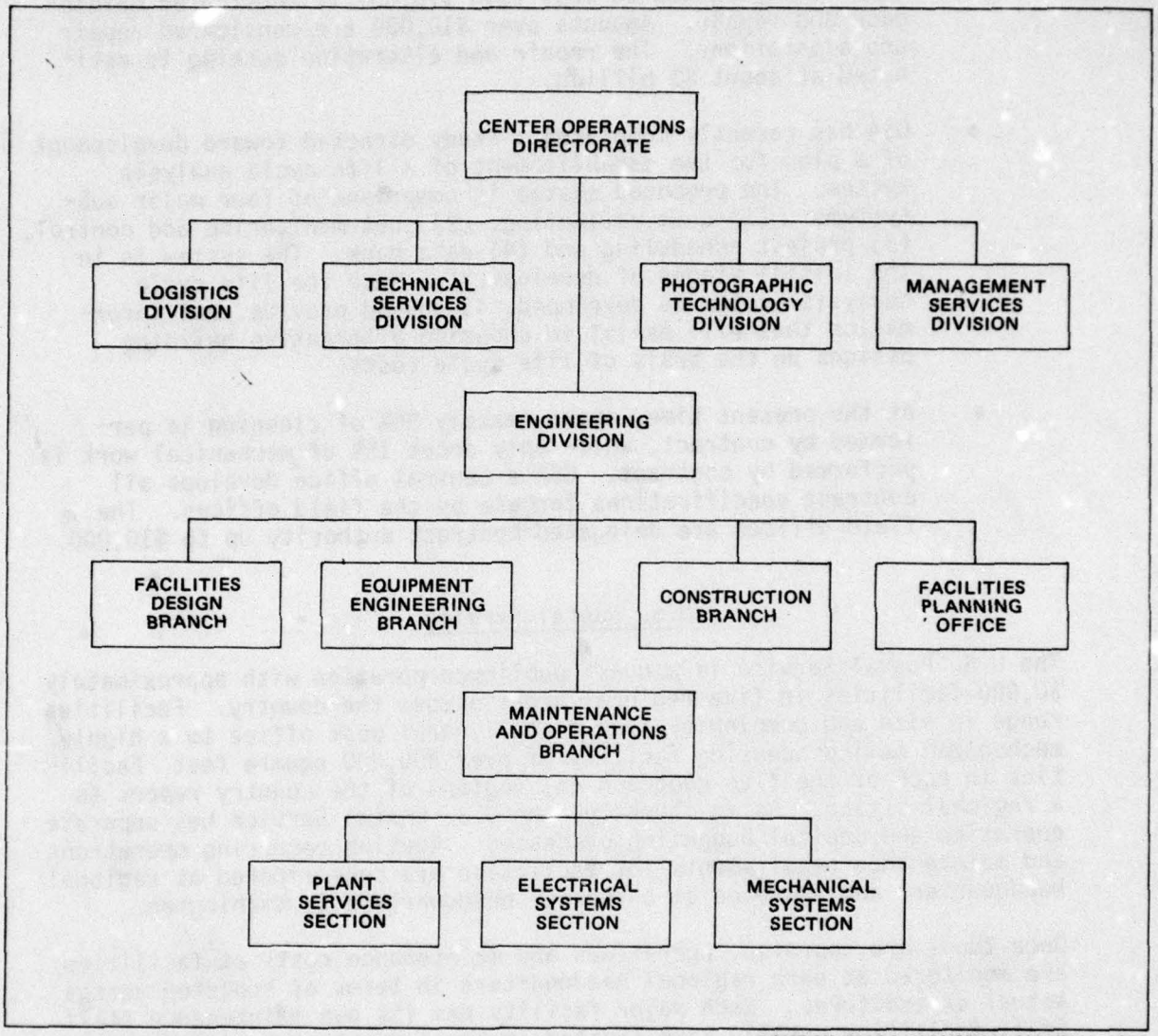
The General Services Administration is responsible for the management of Government property and records, including construction and operation of buildings; procurement and distribution of supplies; utilization and disposal of property; transportation, traffic, and communications management; stockpiling of strategic materials; and the management of the Government-wide automatic data processing resources program.

The organization of GSA consists of operating services and supporting staff offices, with functions carried out at three levels: the central office, regional offices, and field offices.

The Public Building Service (PBS) with its 25,000 employees, is the largest of the GSA services. It is responsible for the design, building or leasing, operation, protection, and maintenance of most of the federally controlled buildings in the nation. PBS has responsibility for 232 million square feet of space in more than 10,000 federally owned and leased buildings.

EXHIBIT V-12

TYPICAL MAJOR NASA FACILITIES ENGINEERING ORGANIZATION



SOURCE: NASA, HOUSTON, MANUAL 1978

The Office of Buildings Management within PBS is the organizational entity primarily responsible for operation and maintenance. Each regional office controls a series of field offices, with each field office controlling a group of buildings.

Aspects of the GSA system that are of particular interest include:

- Any backlog valued at less than $10,000 is considered maintenace and repair. Amounts over $10,000 are considered repair and alterations. The repair and alteration backlog is estimated at about $1 billion.

- GSA has recently completed a study directed toward development of a plan for the establishment of a life cycle analysis system. The proposed system is comprised of four major subsystems: (1) cost estimating, (2) cost monitoring and control, (3) project scheduling and (4) data bank. The system is in the initial stages of development. Once the life cycle analysis system is developed, it should provide cost information that will assist in choosing alternative building designs on the basis of life cycle costs.

- At the present time, approximately 96% of cleaning is performed by contract, while only about 15% of mechanical work is performed by contract. GSA's central office develops all contract specifications for use by the field offices. The field offices are delegated contract authority up to $10,000.

U.S. Postal Service

The U.S. Postal Service is a quasi-public corporation with approximately 30,000 facilities in five regional areas across the country. Facilities range in size and complexity from a small rural post office to a highly mechanized mail processing facility of over 800,000 square feet. Facilities in each of the five geographical regions of the country report to a regional office. As in industry, the U.S. Postal Service has separate operating and capital budgeting processes. Routine recurring operations and maintenance requirements for facilities are consolidated at regional headquarters and approved at corporate headquarters in Washington.

Once funds are approved, operations and maintenance costs at facilities are monitored at each regional headquarters in terms of budgeted versus actual expenditures. Each major facility has its own maintenance staff. Small facilities usually have limited in-house maintenance capability and rely on contract services to accomplish needed work. Nearly all A/E and technical engineering expertise is consolidated at regional headquarters. Because of its massive size, the U.S. Postal Service retains a substantial in-house design capability. For large projects the use of outside A/E firms is common.

Capital investments in excess of $2 million for new construction or major facility improvements require approval by corporate headquarters. For smaller projects, regional management has authority to approve and fund projects. In all cases, a formal economic analysis and justification must be presented to the regional capital investment committee, with additional justification and approval at corporate level required for larger projects.

The U.S. Postal Service has just completed a massive multi-million dollar facilities improvement program to correct building deficiencies and improve working conditions. Outside A/E firms were used extensively to inspect and estimate costs for needed repairs and to monitor improvements made by outside general contractors. Incentives to consolidate facilities so as to reduce distribution costs and, subsequently, costs for operations and maintenance have been dampened by political pressures to keep uneconomical offices open.

In summary, the U.S. Postal Service has a massive network of facilities which are presently reasonably well maintained. Like the Army, it is constrained by a restrictive personnel system, regulatory statutes, aggressive unions, and political considerations.

The separation and use of budgeting systems for recurring and capital items has provided the Postal Service with a simple planning, programming, and budgeting system for real property management.

VI. REAL PROPERTY OPERATIONS AND MAINTENANCE IN INDUSTRY, UNIVERSITY, AND LOCAL GOVERNMENT

VI. REAL PROPERTY OPERATIONS AND MAINTENANCE IN INDUSTRY, UNIVERSITIES, AND LOCAL GOVERNMENT

Real property operations and maintenance systems in industry, universities, and local government were analyzed to determine potential applications to the Army environment. In addition, interviews were conducted with university and trade association personnel to identify areas of advanced thinking and research that may guide the evaluation of alternative RPMA management concepts.

Described in the following sections are the findings relating to organizational concepts, management techniques, and general trends, as well as comparison to the Army systems.

Industry

Research and interviews were conducted in various manufacturing industries in order to assess their approach to the operation and maintenance of facilities. These enterprises involve large numbers of facilities of widely varying complexity and geographical dispersion. Each organization structure is unique, tailored to meet its own peculiar requirements. However, substantial commonality permits the discussion of families of organizations, although minor exceptions do exist.

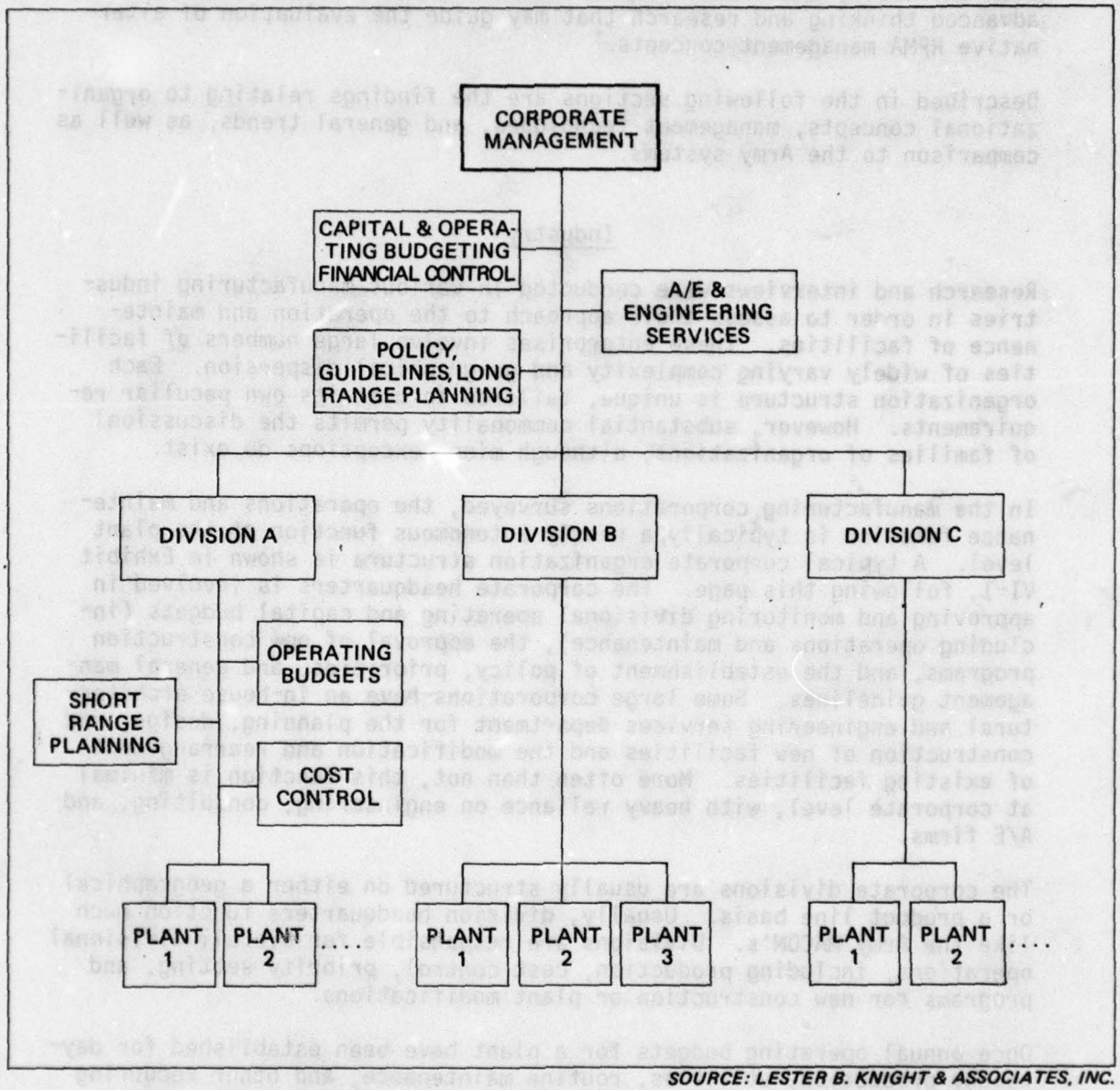
In the manufacturing corporations surveyed, the operations and maintenance function is typically a nearly autonomous function at the plant level. A typical corporate organization structure is shown in Exhibit VI-1, following this page. The corporate headquarters is involved in approving and monitoring divisional operating and capital budgets (including operations and maintenance), the approval of new construction programs, and the establishment of policy, priorities, and general management guidelines. Some large corporations have an in-house architectural and engineering services department for the planning, design, and construction of new facilities and the modification and rearrangement of existing facilities. More often than not, this function is minimal at corporate level, with heavy reliance on engineering, consulting, and A/E firms.

The corporate divisions are usually structured on either a geographical or a product line basis. Usually, division headquarters function much like the Army MACOM's. Divisions are responsible for overall divisional operations, including production, cost control, priority setting, and programs for new construction or plant modifications.

Once annual operating budgets for a plant have been established for day-to-day production, utilities, routine maintenance, and other recurring costs, the plant manager is responsible for carrying out that annual budget and has almost total responsibility, as does an Army installation commander, for accomplishing his mission. The plant manager typically

EXHIBIT VI-1

TYPICAL CORPORATE ORGANIZATION STRUCTURE



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

has the authority to transfer funds among operations and maintenance accounts and other production support functions. Divisional as well as corporate management personnel oversee plant and divisional profitability, as well as facility utilization and facility condition.

Funds for nonrecurring major repairs and new construction are not included in typical plant operating budgets. These special projects are capitalized and are financed through a separate funding process on a project-by-project basis, with corporate headquarters approving all major new capital investments for equipment, fixtures, and facilities. Special projects are usually defined at the plant level, with projects being fully developed and justified at corporate and/or divisional levels.

Capital budgeting procedures vary considerably from organization to organization. The Internal Revenue Service requires that new facilities and equipment, as well as improvements that extend the life of existing facilities, be capitalized and subsequently depreciated over prescribed time periods. Separate capital budgeting systems are used to fund projects for new construction or major improvements.

Capital fund availability is determined annually by corporate management on the basis of profit levels and the general financial condition of the company. Projects at divisions must compete for these limited funds. Usually, the divisions prepare a formal economic analysis for each request for capital funds, indicating the amount of investment required and the anticipated return on the investment. On the basis of economic factors and long-term corporate goals, corporate managers decide which projects are to be funded. Once funded, the new assets provided by the project are assigned to the appropriate division and are included in the division's balance sheet, where they become an integral part of return-on-assets calculations used to measure divisional performance.

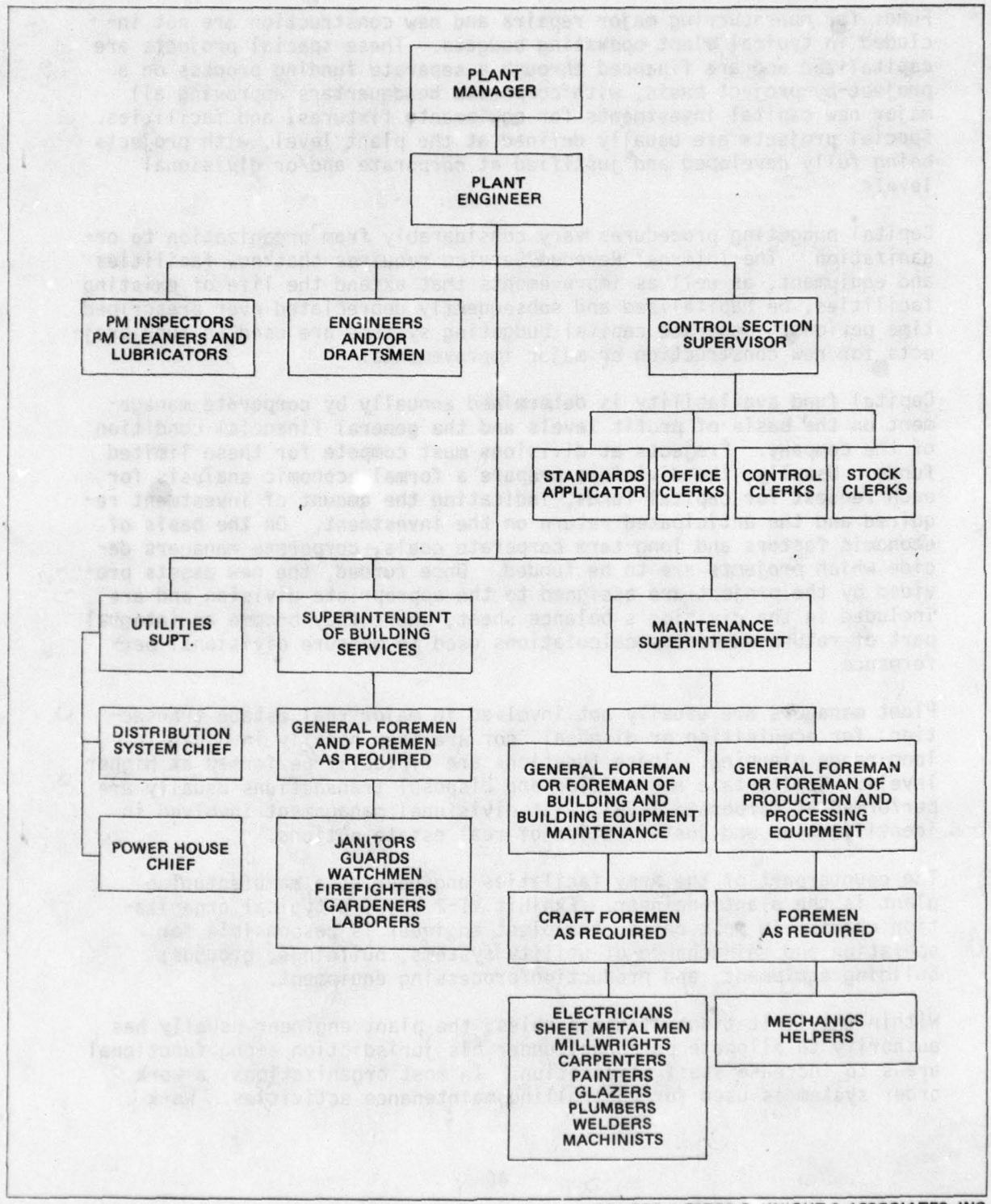
Plant managers are usually not involved in major real estate transactions for acquisition or disposal, nor are they heavily involved in long-range planning. These functions are typically performed at higher levels. Real estate acquisition and disposal transactions usually are performed at corporate level, with divisional management involved in identification and justification of real estate actions.

The counterpart of the Army facilities engineer at a manufacturing plant is the plant engineer. Exhibit VI-2 shows a typical organization chart. In most cases, the plant engineer is responsible for operation and maintenance of utility systems, buildings, grounds, building equipment, and production/processing equipment.

Within the limitations of union rules, the plant engineer usually has authority to allocate personnel under his jurisdiction among functional areas to increase staff utilization. In most organizations, a work order system is used for controlling maintenance activities. Work

EXHIBIT VI-2

ORGANIZATION CHART FOR MAINTENANCE FUNCTION OF A TYPICAL MANUFACTURING PLANT



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

orders are processed, planned, and scheduled in a control section using job estimates or engineering standards to plan repetitive activities. In the report of a previous survey, it was found that, although 8 out of 10 industries use job estimates for planning, fewer than 20% use engineered standards.

Small jobs are usually not highly planned and are left to the discretion of craft supervisors for timely execution. Work force performance is typically controlled by strict time reporting by job category.

The plant engineer maintains budgetary control over his operation by tracking actual vs. budget amounts for numerous line item operations and maintenance activities. Although monthly costs may vary, total annual costs are targeted to a fixed budget.

In the plant engineering organization, production equipment maintenance is given priority over maintenance of facilities, in terms of allocation of staffing and dollar resources. Production equipment must be maintained in order to achieve divisional and corporate profit objectives. The trade-offs relating to profit contributions and long-term protection of real property assets are not as clear for buildings and grounds, since many facility repairs and maintenance activities are somewhat discretionary, in that they do not inhibit the achievement of profit goals, at least on a short-term basis.

Most large manufacturing companies surveyed had formal programs for protecting their facility assets. Nonrecurring or capitalized-type repairs, such as major roof replacements and structural repairs, are usually funded in order to protect or increase the life of the manufacturing facility base, when consistent with long-term corporate objectives. The corporate funding levels for recurring operations and maintenance activities are often determined by the production throughput assigned to production facilities.

In many industries, union pressures have caused most building service functions to be accomplished in-house with union labor. Exceptions are widespread, but the trend is clear. Functions that are generally contracted out include:

- Limited custodial services (administrative offices).
- Maintenance of highly specialized equipment.
- Maintenance and repair of facilities or equipment that are hazardous or expose employees to undesirable conditions.

There is a growing trend for maintenance managers to be competitive with outside contractors for minor alteration and construction projects. Increasing contractor costs and communicaton difficulties between company design engineers and contractors make performance of such work in-house relatively attractive for small projects. In general, con-

tracting-out of recurring services such as custodial or grounds maintenance is not as widespread in industry as in the Army.

In most companies, projects involving major engineering design are contracted to outside firms. Very few companies maintain a large in-house A/E capability.

In manufacturing, the basic problem area in the operation and maintenance of facilities is control of costs. Production equipment and facilities housing this equipment have become highly complex. Maintenance costs, if excessive, can erode profits quickly. In some large manufacturing companies, the maintenance force at the plant level represents as much as 30% of the total plant labor force. In the past, industry has placed great emphasis on reducing and controlling direct labor costs. Because of the success of past direct cost control programs, indirect costs, including maintenance, are focal points in present cost reduction programs.

The rising cost of energy has created a necessity to utilize energy conservation methods and has provided great impetus to proper maintenance of utility plants and distribution systems. Moreover, the high cost of energy has tended to erode the availability of funds for facility maintenance and repair. The following steps are being taken by industry to reduce operation and maintenance costs:

- Development of energy conservation programs and greater analysis of energy consumption and cost data.
- Greater use of engineered work measurement standards to evaluate labor performance. Estimates indicate that implementation of an effective measurement program can increase productivity by up to 30%.
- Development of a preventive maintenance program for equipment and buildings.
- Greater reliance on computer systems to process work orders and to plan, estimate, and schedule work requests. The net benefit is a reduction of paper-processing and associated labor, and a reduction in inventories of repair materials.
- Greater emphasis on training of maintenance personnel.

The systems presently used in industry for the operation and maintenance of facilities are generally highly effective and cost-efficient. Industry is able to perform its O&M function more effectively than the Army because of the following factors:

- Industry is highly cost-conscious and uses relatively simple financial controls to monitor performance. The Army is not as readily able to evaluate cost impacts

nor is its budgetary system designed for effective financial management.

- Industry has the flexibility to adjust its personnel levels to meet fluid work load requirements to a larger extent than the Army, which is encumbered by its civilian personnel system.

- Industry is highly conscious of the way its facilities are utilized. Aggressive management of corporate assets tends to reduce the number of operating facilities to as few as possible to accomplish the assigned mission. The Army system does not monitor facility utilization to this extent and does not balance real property assets with mission requirements.

- Industry typically consolidates technical engineering expertise above the plant level, unlike the Army system where each installation has a technical engineering capability.

- Industry clearly separates the planning and budgeting process for recurring and nonrecurring O&M activities. Under the Army system, no formal distinction is made between these activities.

- Industry direct overhead for O&M operations was found to range from 7% to 10% as compared to over 20% for an FE organization at an installation as detailed in Appendix A.

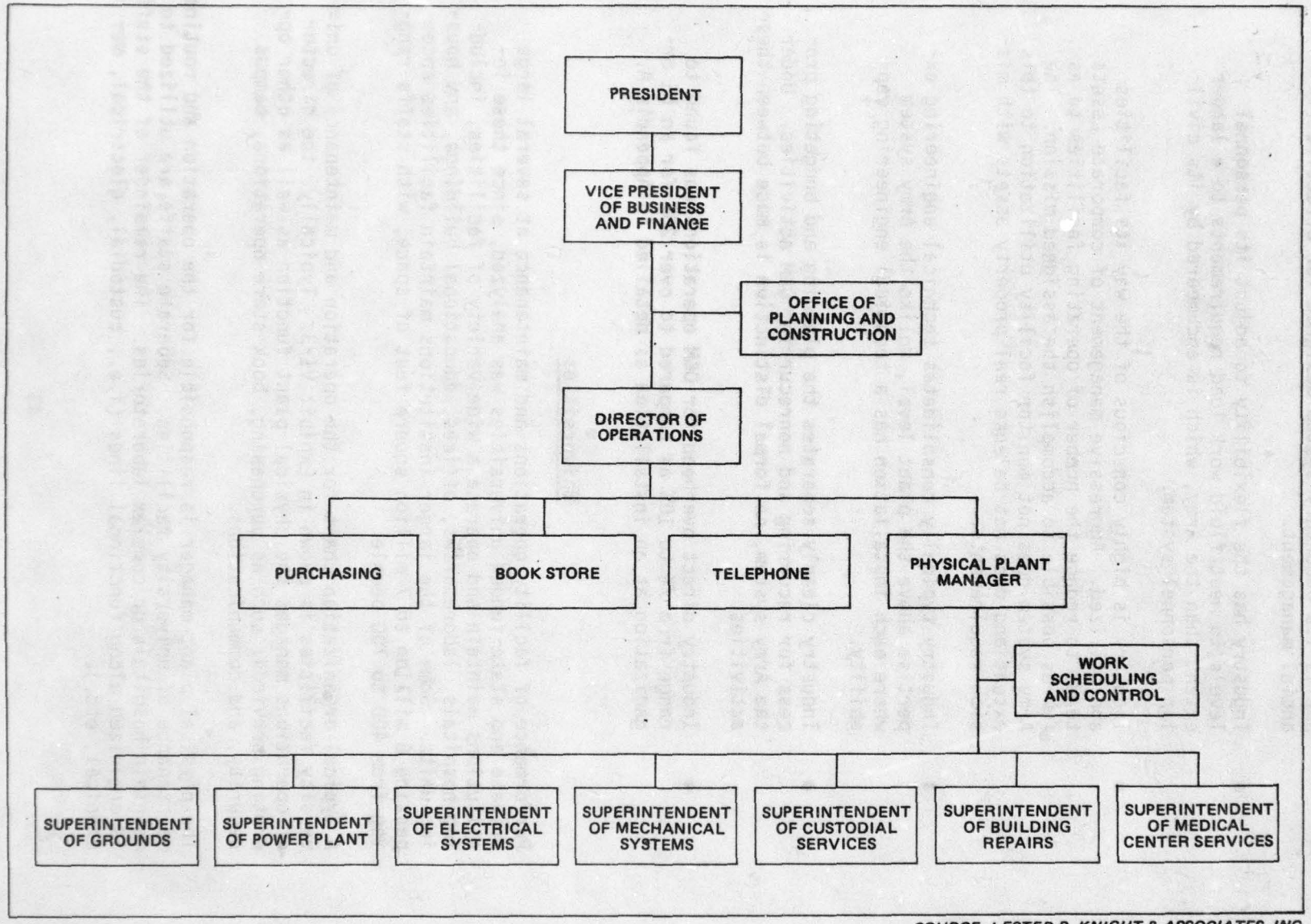
Universities

Performance of facility operations and maintenance at several large private and state-funded universities was analyzed, since these institutions maintain and operate a wide variety of facilities, including hospitals, laboratories, offices, educational buildings, and housing units. Some of the larger institutions maintain facilities encompassing 6 million to 7 million square feet of space, with staffs ranging from 400 to 700 people.

A typical organization chart for the operation and maintenance of university facilities is shown in Exhibit VI-3. Typically, the director of operations manages the physical plant function as well as other operating services, such as purchasing, book store operations, campus security, and communications.

The physical plant manager is responsible for the operation and routine maintenance of university facilities. Separate staffs are utilized to maintain hospitals or complex laboratories. The remainder of the staff is organized along functional lines (i.e., custodial, electrical, mechanical, etc.).

ORGANIZATION CHART FOR MAINTENANCE FUNCTION OF A UNIVERSITY



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

EXHIBIT VI-3

Major repairs and alterations, as well as any new construction, are normally planned by an office of planning and construction. This function generally reports above the level of the physical plant manager in the organization. Usually, this office does not have a large engineering staff. Once projects have been conceptually defined, outside A/E firms are utilized for detailed design and construction activities. Special projects are funded by capital appropriations and are not within the responsibility of the physical plant manager.

Since universities have many educational departments and research functions, requests for building services emanate from many sources. If the task on a work request is not within the physical plant manager's normal operating budget, the department requesting the service must provide funds prior to execution of the work. These types of arrangements are utilized for special tenant requests for minor alterations, rearrangements, and building modifications to accommodate special educational or testing programs. All repair and maintenance associated with basic building systems (heating, air-conditioning, plumbing, etc.) are included in the physical plant manager's operating budget. Major repairs are usually financed by special university appropriations.

The major control of O&M activities is budgetary. Operation and maintenance logs are kept for each building and are used as a basis for establishing future resource requirements.

Approved work requests are scheduled by the superintendents and foremen in the craft shops. Minor repair/maintenance jobs are not formally estimated or planned. Jobs requiring in excess of 40 man-hours are usually planned in greater detail and reviewed by superintendents prior to execution. Materials are procured through the university purchasing department or through local vendors.

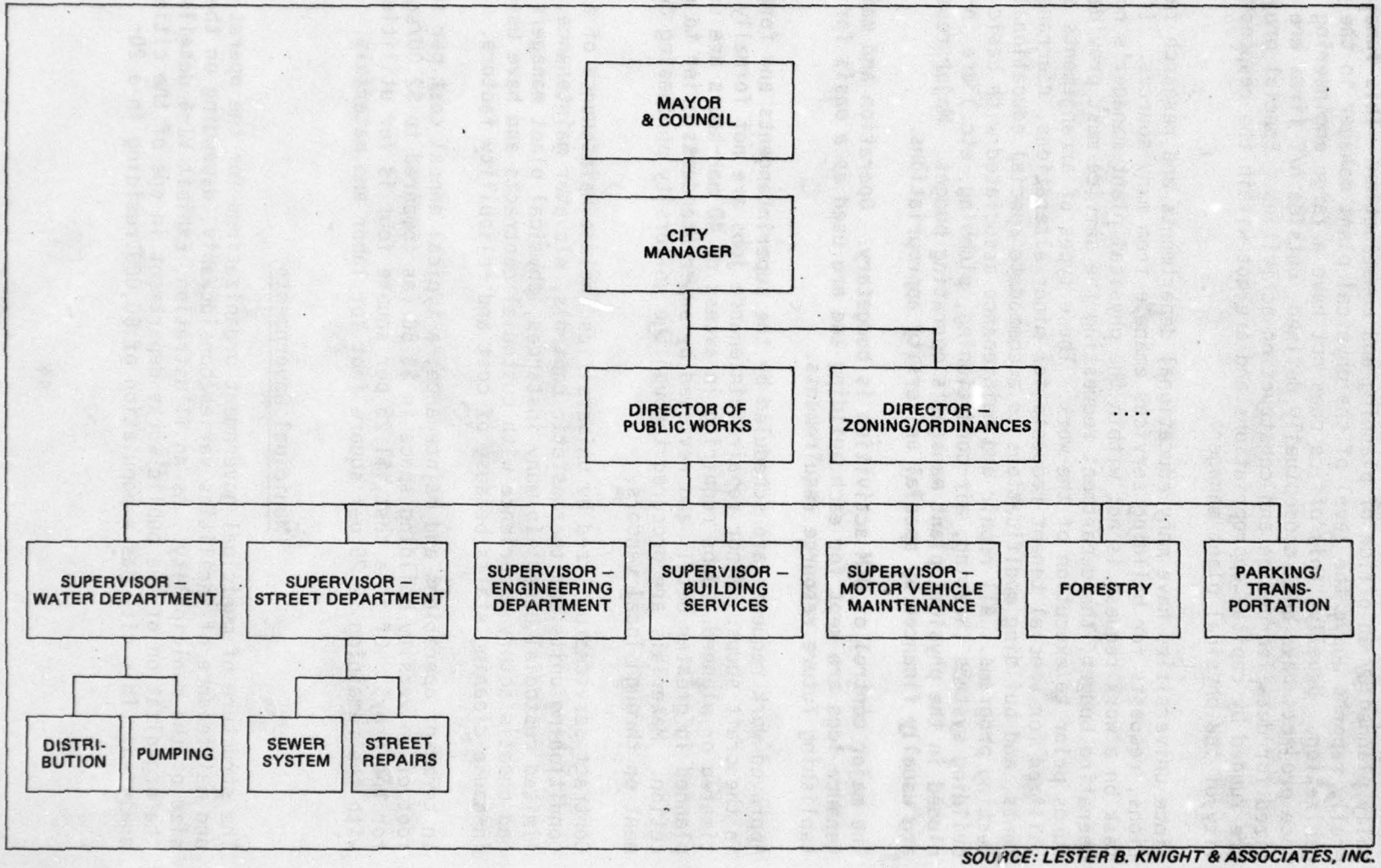
Contract services utilized by universities include maintenance of air-conditioning units and thermostatic controls, elevator maintenance, and limited custodial care. In many instances, physical plant managers have had unsatisfactory experience with custodial contracts and have used in-house cleaning staffs because of cost and reliability factors.

In terms of operations and maintenance, a typical annual cost per square foot of university building space is $3.50 (as compared to $2.00/sq. ft. for the Army). Of this cost, $1.25 per square foot is for utilities, with the remaining $2.25 per square foot for labor and materials.

Municipal Governments

The structure of municipal government organizations for the operation and maintenance of facilities varies considerably, depending on the size of the municipality. As an illustration, Exhibit VI-4 details the organization of the public works department in one of the cities analyzed. This city has a population of 60,000 residing in a 20-

ORGANIZATION CHART FOR MAINTENANCE FUNCTION OF A SMALL CITY



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

EXHIBIT VI-4

square-mile area. The public works department has a staff of about 70 people, excluding secretarial support. The organization is responsible for maintaining municipal buildings, streets, water mains, traffic signals, and water storage and distribution systems and for maintenance of grounds.

A small staff of about ten in the engineering department provides technical support to other departments and is engaged in the following functions:

- Design of public works projects.
- Inspection of construction projects.
- Engineering studies.
- Preparation of specifications and bidding documents for contract A/E services.
- Energy conservation.

Requests for maintenance are handled on an individual basis, with department supervisors ordering maintenance crews to the site immediately for emergencies and scheduling routine calls on a first-call/first-served basis.

The primary control of the maintenance function is fiscal, through the establishment of departmental budgets. Budgets are developed by department heads, submitted to the director of public works for review/revision, and then sent to the village manager for review.

Generally engineering standards and performance measurement systems are not used. Few management reports, other than monthly financial reports, are used in the control of the maintenance operation.

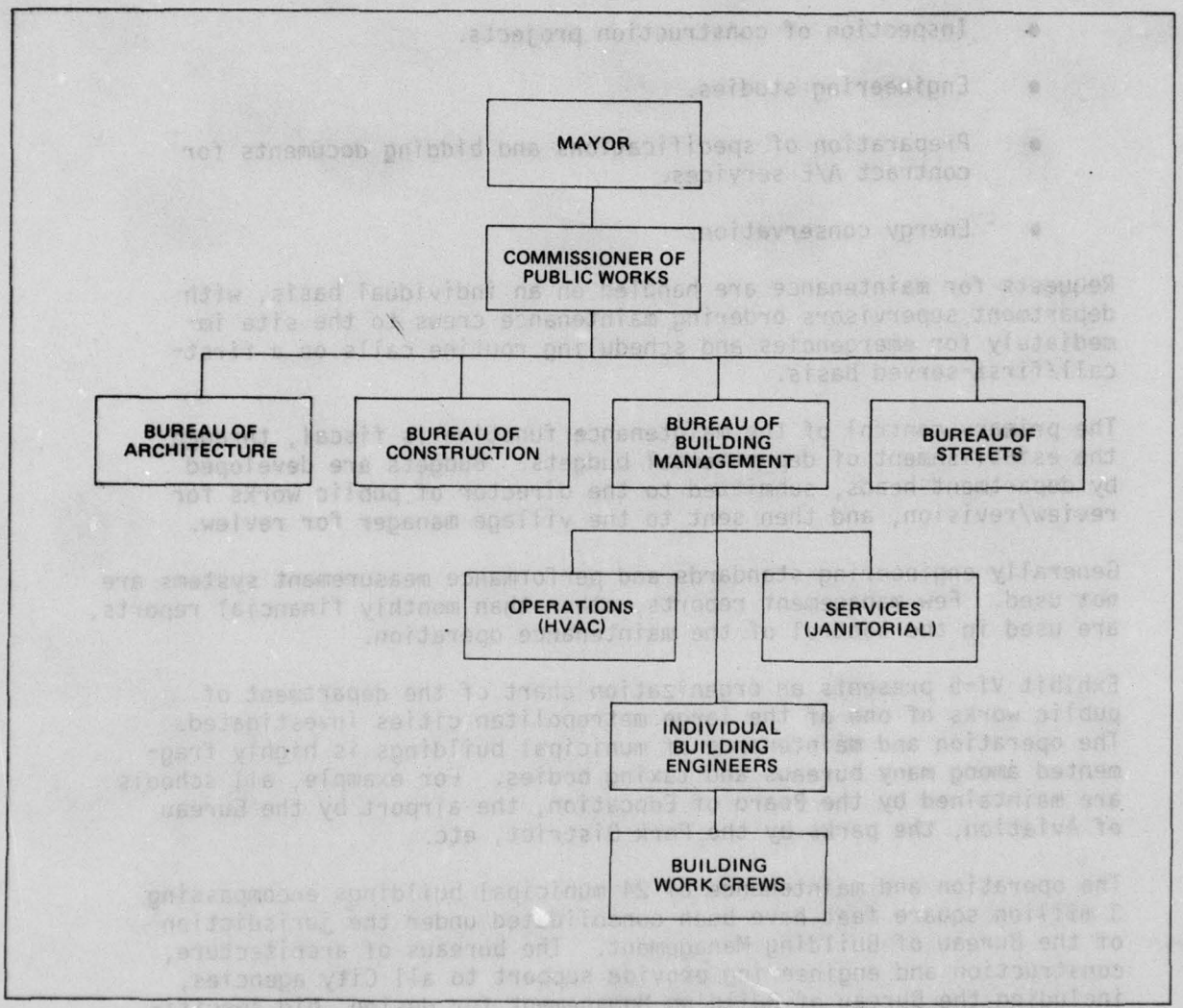
Exhibit VI-5 presents an organization chart of the department of public works of one of the large metropolitan cities investigated. The operation and maintenance of municipal buildings is highly fragmented among many bureaus and taxing bodies. For example, all schools are maintained by the Board of Education, the airport by the Bureau of Aviation, the parks by the Park District, etc.

The operation and maintenance of 24 municipal buildings encompassing 3 million square feet have been consolidated under the jurisdiction of the Bureau of Building Management. The bureaus of architecture, construction and engineering provide support to all City agencies, including the Bureau of Building Management for design, bid specification, new construction/renovation, and technical engineering support.

Centralized craft shops are managed by a manager of operations. Work crews are dispatched to the job sites when requests for building re-

EXHIBIT VI-5

ORGANIZATION CHART FOR MAINTENANCE FUNCTION OF A LARGE CITY



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

pairs are received. Minor maintenance and custodial services are handdled by small work crews assigned to each facility. These crews are locally supervised by a facility operating engineer. All custodians are under the jurisdiction of a manager of building services. The operating engineer in each building is responsible for work scheduling and execution.

The primary means of control is budgetary. Monthly expense reports are used to compare costs with approved expense budgets. Major repairs and maintenance are funded through special appropriations from the City budget.

As a measure of performance, expenses for routine operations and maintenance are tracked against known commercial costs for office buildings in the same locale. For example, the City's average annual cost per square foot for operating and maintaining its facilities was $3.88 ($2.77 for labor; $.41 for material, and $.70 for utilities). This compared relatively well to $3.67 per square foot for the commercial sector, as reported by building owners associations.

The use of contracting in city and county governments has been most wide-spread in California. Some cities in the Los Angeles area have relied on contracting for all service activities. For example, Lakewood, California, with a population of over 80,000, was the first "contract city."

Cities heavily involved with contract services have formed a California Contract Cities Association for the exchange of studies and contract specifications. These California cities have ready access to a source of contract services, in that the county of Los Angeles is a major provider of municipal services. The county can provide services ranging from a complete package to some 36 specific functional services, including:

- Police protection
- Fire protection
- Public works
- Health services
- Engineering services
- Tree trimming services
- Signal light maintenance
- Refuse collection
- Street sweeping
- License enforcement
- Park maintenance
- Planning and zoning activities
- Traffic lane striping
- Traffic engineering
- Purchasing

Los Angeles County, however, is not the only provider of services, as many private contractors compete for city business. Some services such as license enforcement require a government contractor with police powers, but many services, including fire protection, can be provided by private enterprise.

Some cities have joined together in consortia to engage in joint venture contracting and, in some cases, one city becomes the provider of common services to all other members on a contract basis.

An interesting sidelight exists in the Ventura County, California, Public Works Agency, which has adopted a policy of contracting out a maximum of its activities, while retaining a limited internal capacity to perform services in-house. The staff prepares an in-house bid for activities in competition with private contractors. Public works employees also form teams which submit "cost certain" bids for services to cities within the county. They are then held responsible for delivery of services at the stipulated cost.

In contrast, Los Angeles County does not give "cost certain" bids but rather gives an estimate and bills for costs incurred determined by fixed rates for time, equipment, materials, and overhead.

It is difficult to compare the quality of maintenance in cities to that in the Army. Although central cities would fare poorly in comparison to an Army installation, cities such as Lake Forest, Illinois; Chevy Chase, Maryland; or Beverly Hills, California are as well if not better maintained than an Army installation.

In comparing the effectiveness of cities and the Army in terms of operating and maintaining facilities, it is important to realize that there are major differences in objectives. The Army installation provides a setting for mission accomplishment and for housing of some of its own personnel. In effect, it is more similar to the "company towns" of the early part of this century, such as Pullman, Illinois, than to a modern city. Cities on the other hand, particularly central cities, must provide an environment for anyone choosing to locate within the borders. Therefore, cities must be prepared to provide services for the entire range of the socio-economic structure.

Consequently, it is difficult to compare, on a meaningful basis, the effectiveness of municipal maintenance systems to the Army because of differences in system objectives.

Management Concepts

In conjunction with the analyses of real property management systems in industry, universities and muncipalities interviews were conducted

to ascertain the "state of the art" in terms of management concepts for maintenance activities. On the basis of interviews and analyses, several important concepts have emerged as significant to the proper management of the maintenance function. These concepts are presented in the following paragraphs.

Decentralization

In many universities and industrial organizations, maintenance activities are managed by a local superintendent who has relatively few restrictions on his activity, except the constraints of a budget approved by the top management of the activity. The control measures to ensure that effort is expended on the activities required for adequate maintenance of the facilities are built into the budget process. For example, the cost for preventive maintenance activities on electrical equipment would be included in the electrical department's budget. When actual costs differ from budget, explanation of the variance is required.

Organizational Separation of New Construction and Maintenance

In many instances, responsibilities for new construction and maintenance functions are at different organizational levels. For example, plant maintenance may be managed by a local plant engineer or maintenance manager reporting to the plant manager, while new construction or capital improvement functions would normally be managed at a division or corporate level. Generally, the design and engineering will be performed by a private architectural and engineering firm with guidance and input furnished by corporate headquarters. The maintenance manager is not normally included in the approval process for design or construction of new facilities. The exception to this is when a totally new or unique maintenance requirement may result (e.g., specific maintenance equipment needed).

Intracompany Pricing of Maintenance Services

A number of companies and institutions have organized the maintenance function as a cost center; that is, maintenance services are priced and charged to the user departments.

One such organization that employs this concept is Harvard University. Each university department has its own separate budget and can therefore purchase the level of operations and maintenance necessary to meet its requirements. The maintenance department must also earn a profit by marking up the price over the cost of providing the service. This creates an incentive for the maintenance department to be competitive and efficient, so that the individual school or profit center does not decide to buy the services elsewhere. While this system requires additional record-keeping and cost analysis, the improved service to the buyer and efficiency of the seller offset the additional expense.

Life Cycle Costing

Life cycle costing refers to evaluating the initial facility investment in conjunction with future operating costs for several design alternatives and selecting the alternative with the lowest present value cost over the life of a facility. The impact of high inflation on prices, costs, and demand for a product can quickly change the profitability of a previous investment. This makes it particularly important for a well-managed company to evaluate present vs. expected future costs for many alternative designs and future economic conditions.

There is more incentive to use this concept in private industry than in government because the concern for future cost, profitability, and efficiency levels is greater in the private sector. However, the concept is equally appropriate for the Army, as resources need to be managed and controlled more efficiently.

Career Development Opportunities

In industry and local government, it was found that, for the most part, the position equivalent to the facilities engineer is considered part of an engineer career field. For example, in cities and counties, there are definite promotional opportunities within the field of local administration. The career path begins at the level of a small city or village and leads to cities or counties of larger jurisdiction. Typically, when a manager feels he is ready for advancement, he presents his qualifications to the governing body of larger jurisdictions. In this manner, the more competent and successful managers gain greater responsibility and the larger cities or counties obtain the benefit of having the services of a proven "facilities engineering" manager.

It is common to find managers who have served in four or five cities or counties, and as many as 70% of appointments are of candidates with previous experience in other jurisdictions. This selection process has contributed significantly to the professionalism and quality of local governmental administrators. The International City Management Association and other professional associations continue to provide opportunities for career training and development.

Within industry, promotional paths are from engineer of a small plant to engineer of larger plants. Also, divisional engineering managers are frequently chosen from among the most able of the plant engineers. Ultimate promotion of the most competent to the corporate headquarters engineering staff ensures experienced and competent leadership.

Similarities to industry and local government procedures also exist in the Navy and Air Force. The Navy Public Works Officer perceives public works as integral to the engineer career path. Although some engineers are assigned to Seabee, construction, or staff work, most Naval engineers are engaged in public works and look to this field as their primary avenue for promotion as well as satisfaction.

The Air Force Civil Engineering officer perceives his career opportunities even more specifically in the base civil engineering field. Because of the Air Force's PRIME BEEF thrust wherein a large percentage of RPMA work is carried out by military personnel, the Base Civil Engineer has the added career advantage of troop command. Typically, BCE's are selected for promotional assignments on the basis of previous BCE experience.

VII. PROBLEM AREAS IN THE ARMY'S REAL PROPERTY SYSTEM

VII. PROBLEM AREAS IN THE ARMY'S REAL PROPERTY SYSTEM

General System

On the basis of analyses of the Operations and Maintenance component of the RPMS, as well as review of management systems and concepts used in other organizations, several key problem areas have been identified that demonstrate the need for improving the current Army system. While some of these problems can be alleviated within the framework of the existing organizational structure, others indicate the need for careful examination of the ability of the current system to resolve these deficiencies. These problem areas are listed below and are discussed in detail in the following paragraphs.

- Effective management coordination requires the involvement of many headquarters and authorities.
- Optimum allocation of resources is difficult to achieve.
- The effectiveness of the existing system is diluted by numerous regulations and reporting requirements.
- Planning requirements are overly complex.
- Performance measures or means of evaluating efficiency and effectiveness are inadequate.
- The Army's RPMA resource requirements are frequently challenged by Congress.
- Although the RPMA work load is increasing, resources are declining.

Fragmented Responsibility for RPMA Management at DA Level

The present management of RPMA at DA level is divided among the Controller of the Army (COA), Chief of Engineers, the Deputy Chief of Staff for Logistics (DSCLOG), the Deputy Chief of Staff for Personnel (DCSPER), and the Deputy Chief of Staff for Research and Development and Acquisition (DCSRDA). The involvement of each of these organizations in RPMA is briefly summarized below:

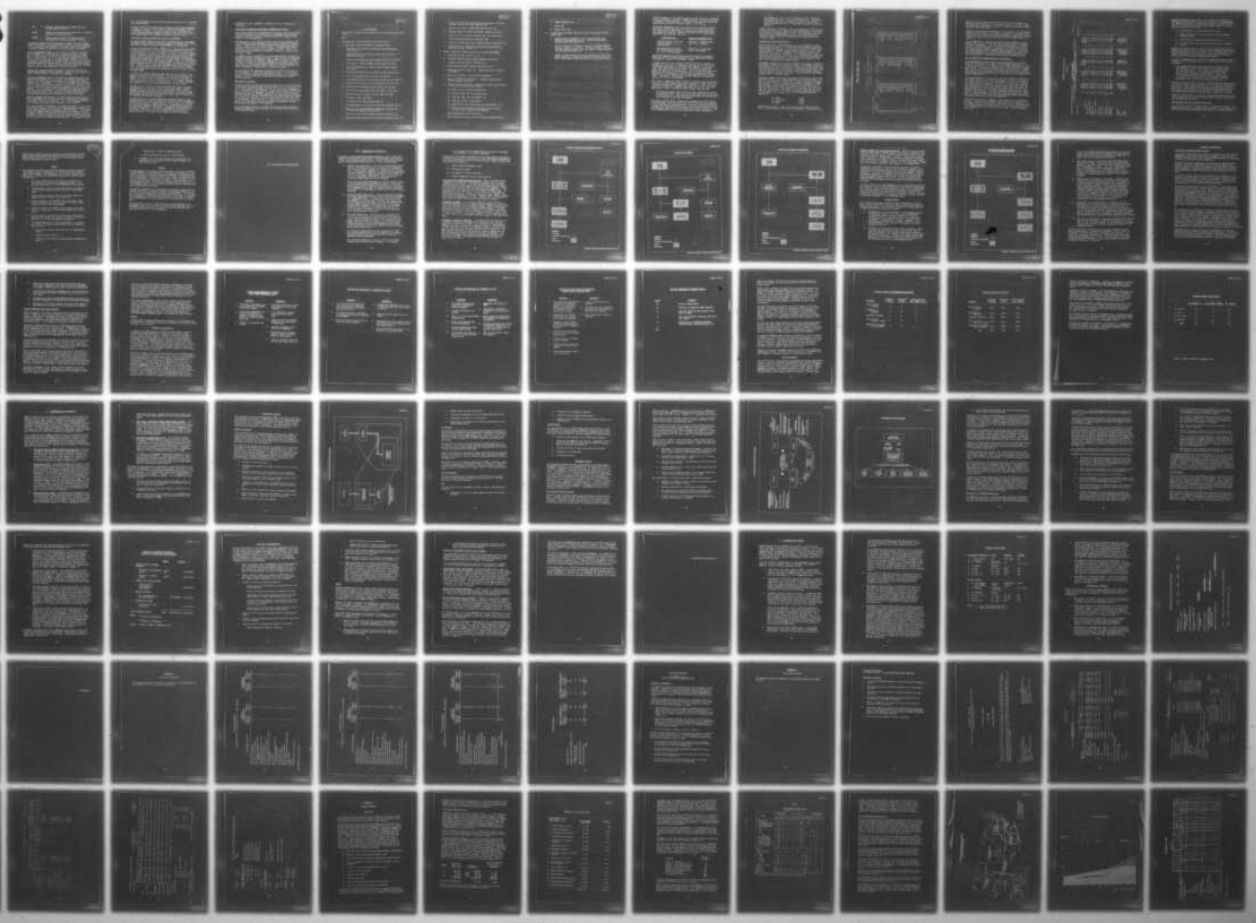
COA - Serves as program director of Program 11 (OMA); allocates and controls RPMA dollar resources.

COE - Provides technical guidance and policy for RPMA; defends RPMA budget requests.

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DCSLOG - Controls maintenance/service (M/S) vehicles; performs supply functions.

DCSRDA - Manages the modernization of GOCO plants, including maintenance-oriented projects.

DCSPER - Controls Army personnel levels and personnel requirements for family and bachelor housing.

Fragmented responsibility for management of RPMA at DA level results from (1) that RPMA is not directly tied to mission, and (2) that RPMA is not a distinct prime objective of the Army. Thus, it is managed as a secondary function by the various mission directors at DA level.

Cohesive management of RPMA is more difficult to achieve because of the involvement of various agencies. The present system of management of RPMA at DA level inhibits COE from acting as the proponent for all forms of RPMA. COE is not involved in the O&M of real property facilities when they are funded by RDT&E. Neither is the Chief of Engineers the proponent for the O&M of inactive facilities at government-owned contractor-operated plants. These facilities are presently funded by 728011 funds, which are classified as mission funds, although they are used for the maintenance of inactive facilities.

Although OCE summarizes RPMA requirements reported by the field and defends budget requests before Congress, it does not directly participate in the allocation of resources to the MACOM's.

The system management concept at DA level can potentially result in a mismatch between RPMA dollar, personnel, and equipment resources allocated to the field, since these resources are controlled by separate organizations. For example, it is not at all uncommon for an FE organization to be allocated funds, especially at year end, and have difficulty in spending the money effectively, because of a lack of available manpower. For this reason, money is diverted from high priority work such as utility system repair, to lower priority requirements such as road resurfacing, which can be more easily accomplished through an existing open-end contract to obligate funds prior to year end.

Obtaining adequate M/S equipment in a timely manner to match anticipated requirements can be a major problem. Procurement of equipment is extremely slow and can take years. As a result, manpower can be wasted because the right kind of equipment is not available.

The complex planning, programming, and budgeting system utilized in the Army is made necessary in part by the divided management responsibility at DA, which requires multiple approval and review levels. For example, installation RPMA budgetary requirements which have impact on dollar, personnel, equipment, and housing resources are consolidated, reviewed by MACOM's, and then reviewed again by COE, DCSPER, DCSLOG, DCSRDA, and COA to assess the total impact on Army resources. The process is leng-

thy, and considerable coordination and administrative effort is required for accomplishment.

Multiple technical and administrative reviews of repair and maintenance projects are required in the system at installations, MACOM's, and DA. In DARCOM, for example, a project estimated to cost $350,000 would require administrative and technical review at the installation, Major Subordinate Command (MSC), DARCOM headquarters, and DA levels.

Difficulty of Achieving Optimum Allocation of Resources

The basic system concept for execution of RPMA through the Army Command Management System inhibits optimum allocation of resources, since it is difficult to transfer resources between MACOM's for optimum use.

Moreover, the decentralization of RPMA to the installation level results in high overhead levels in the FE organization because of the need to duplicate functions at each installation. Appendix A presents an analysis of overhead for installations of various sizes, based on DA staffing guides. Assuming that the installation were staffed according to the design logic of the Army's decentralization philosophy, this analysis shows that overhead levels would vary from 22% to 25% in FE organizations and that as much as 50% of that overhead burden is required for clerical, general administrative, engineering management, and other support activities. Industry typically has lower overhead rates than an FE organization, since engineering design activities are centralized at a higher level and reporting and paper work burdens are not as stringent as under the Army system.

Facilities utilization reporting, other than that for housing, is not presently required by the Army system. For this reason, DA level management has limited means of measuring current mission requirements against existing real assets to determine if facilities have the capacity and capability to meet assigned missions. This further compounds the problem of allocating resources where they are most needed.

The Army's use of life cycle costing to reduce total costs of owning and operating its facilities is still in its first stages. Greater management action is needed to ensure that new facilities will be constructed and operated at minimum life cycle cost. The present system, while recognizing the need for life cycle costing, does not effectively tie together RPMA and MCA management.

The year-end flurry to obligate RPMA funds released through the Army command system can be highly disruptive to the FE in terms of preparing an orderly work plan for accomplishment in a given year. An installation contract approach to reduce the effect of reprogramming on the FE has been used in TRADOC installations. An example of this contract is presented in Appendix B. In essence, the MACOM and installation formally agree to the work load to be accomplished and the level of funding required. On the basis of estimates of funds and supplies

throughout the year, agreement is reached as to the scheduling of activities.

Regulatory and Statutory Limitations on RPMS Effectiveness

The existing system is so encumbered with regulatory and statutory limitations that much of the installation FE's management effort must be devoted to designing projects and determining how to accomplish them without violating regulations.

Overregulation of FE activities requires detailed record keeping, multiple reviews at higher management levels, and preparation of numerous reports. Correction of this one problem would reduce present administrative burdens at the installation level. Over 120 DA publications presently in effect relate to the performance of RPMA. Some of the most restrictive regulations are detailed in Chapter 3, Volume III of the Phase I study.

In addition, the FE is required to complete approximately 30 technical engineering reports throughout the year. Almost one-third of these are imposed by the Corps of Engineers. Report contents range from identification of installation resource requirements to a monthly listing of the number of rodents exterminated. TRADOC engineering personnel prepared a list of the required reports relating to FE activities and this list is reproduced in Exhibit VII-1 following this page.

The existence of the regulatory and statutory limitations, as well as the requirements for facilities engineering reports, are indications of the difficulty of managing a decentralized system of this magnitude. However, it is the only way in which OCE can perform the technical direction mission.

Complexity of Planning

DA Pamphlet 420-6 indicates that the funding guidelines and data provided in the Command Operating Budget Estimate (COBE) at each installation are to be used to prepare the Annual Work Plan and the Resource Management Plans. Examination of the documents at some installations indicated that they are not closely integrated. For example, data reviewed at one installation showed that the COBE prepared in June indicated a requirement for $31.6 million, whereas the Annual Work Plan (AWP) prepared in October of the same year indicated a work load that translated into a $63.5 million requirement. While the level of funding could increase during this period, it is difficult to explain why these two documents indicate conflicting requirements of this magnitude.

Much of the data contained in the AWP are highly detailed and must be constantly changed to reflect funding level fluctuations and changes in anticipated work loads.

LIST OF REPORTS

1. DA/DOD Reports required from TRADOC which do not require installation input:

   None.

2. DA/Higher Reports which requires installation input:

   a. GSA Lease Costs, OMA Program 9, Budget-1093 (AR)

   b. Demolition of Structures as Related to New Construction (Cong-1159) (A)

   c. Status Report on Environmental Programs and Activities (DD-H&E (A) 1269 (A)

   d. Council of Environmental Quality Report (DD-H&E (Q) 1326 (Q)

   e. Environmental Impact Statements (DD-H&E (AR) 1327 (AR)

   f. Facilities Engineering - Special Projects Report (DD-I&L (SA) 431 (A)

   g. Installation Natural Resources Report (DD-I&L (AR) 670 (A)

   h. Pest Control Summary Report (DD-I&L (AR) 1080 (M)

   i. Environmental Protection Control Report (DD-I&L (SA) 1383 (SA)

   j. Nonappropriated Funded Construction (DD-I&L (SA) 1167 (SA)

   k. Determination of Bachelor Housing (DD-I&L (A) 1219 (A)

   l. Unconstrained Requirements Report (DD-COMP (A 1092) (AR)

   m. National Register of Historic Places (DOI-1005) (AR)

   n. Fire Report (ENG-7 (R3) (AR)

   o. FE Technical Data Report (ENG-94 (R8) (A)

   p. FE Command Analysis of Utilities Operations (ENG-113 (R3) (A)

   q. Basic Info & Future Development Components of Master Plan for Army Inst. (ENG-126 (R3) (A) (AR)

   r. Backlog of Maint & Repair (BMAR) Obligations (ENG-27) (Q)

   s. Bachelor Housing Capacities & Utilization (ENG-236) (Q, SA, A)

t. Status of US Army Inst Compliance with the National Pollutant Discharge Elimination System (ENG-237) (SA)

u. Military Const Army, Program Reporting (ENG-240) (A)

v. Emergency Expansion Capability Document (ENG-241) (A, AR)

w. Report of Oil or Hazardous Substance Spill (EPA-1001) (AR)

x. Discharge Monitoring Reports (EPA-1002) (AR)

y. Commercial Design Motor Vehicle Required Review (CSGLD-1577) (A)

z. Solid Waste Source Separation & Resource Recovery/Recycling Operation (DD-I&L (A) 1436) (A)

3. Reports required by TRADOC that do not go outside the command:

a. DFAE Manning Levels, (ATEN-11) (SA)

b. Engineer Troop Utilization Report, ENG-253, ATEN-14 (Q)

c. Engineer Unit Weekly Report, ATEN-15 (W)

d. Maintenance and Repair Backlog, ATEN-297 (R1) (Q)

e. DFAE Excess Report (Exempt RCS) - TRADOC Form 683-R, required by AR 420-17

f. M&S Equip. Listings. Send to DFAE for updating:

g. Stock Fund Stratification Report. Prepared by DFAE and submitted to OENGR thru DCSLOG

h. Financial Reports Processed - DCSRM Reports which we get copies of for which the DFAE provides input:

(1) ATRM-2, Status of Operating Resources

(2) ATRM-104, COBE, BER from installations

(3) ATRM-205, COBE, BER from TRADOC to DA

(4) CSCAB-218, Status of Obligations

(5) PARR (No RCS) from installations and from TRADOC to DA

(6) ATRM-306, Cost Estimating Percentages (used as a basis for "Army Forces Planning Cost Handbook")

i. Monthly submission of utilities bills

j. Annual submission of sales rate calculations (TRADOC PAM 420-1)

k. Sewage Treatment Logs

l. Water Logs

m. Boiler Plant Logs

4. In addition to the above items the FE Div also receives the following Items:

a. Copies of boiler inspections (high pressure steam - semi-annually; high temperature water - annually) performed by the Hartford Boiler Insurance Co.

b. Copies of chemical, radiological and pesticide water analysis for each installation (annual). Analyses are made by the US Army Environmental Hygiene Agency on samples of water submitted directly by the installations.

c. Copies of high pressure boiler water analyses for each installation (monthly). Analyses are made by US Bureau of Mines on boiler water samples submitted directly by the installations.

Actual performance is not reported against the AWP to measure performance or track significant variances. Perhaps the most significant indicator of problems with the usefulness of the AWP is that only one-half of the installations surveyed in the Army prepare or use the plan.

The Resource Management Plan for an installation as defined in DA Pamphlet 420-6 further duplicates detailed sections of the Annual Work Plan and results in added effort in preparing and updating the basic data needed for planning. Examples of sections of the reports which essentially duplicate each other are:

Annual Work Plan	Resources Management Plan
Financed Portion of Plan and Funding Summaries of J, K, L, and M Accounts.	Section II - Summary Annual Work Plan - Financed
Unfinanced Portions of Plan and Funded/Unfunded Summaries of J, K, L, and M Accounts.	Section III - Annual Work Plan -- Unfinanced

Additional problems have been observed with the Army's installation master and facility planning systems, which are described in detail in Volume III, Chapter 5 of the Phase I report.

The major portion of the facilities planning activity in the Army is carried out at two levels in HQDA and at the installation level, with intermediate coordination by the Major Army Commands. At the HQDA level, more than 20 sets of regulations, policies, and guidelines govern the facilities planning process. These include five regulations governing stationing and utilization policy, three governing family housing policy and management, and four governing mobilization requirements. The result of this has been divided responsibility regarding facility utilization and management.

This results in Army-wide underutilization of facilities and inefficient utilization of RPMA resources to maintain unneeded or unused facilities. A General Accounting Office (GAO) report dated July 1, 1977 (77-313) on facilities utilization in USAREUR found that $16.7 million could have been saved in 1975 if available bachelor quarters had been used:

> "An Army Audit Agency report issued in 1974, showed the facilities to be underutilized. That report noted that about $28 million could be saved annually if activities were consolidated and unneeded facilities returned to the German Government."

The report provided further indicators of problems in the Army's master planning system. Each installation master plan requires the preparation of up to hundreds of detailed drawings, site plans, and building layouts, in addition to narrative descriptions of existing and proposed facilities. The GAO report made the following comment after review of several of the plans submitted which had yet to be reviewed at higher headquarters:

"We reviewed the master plans for Augsburg, Munich, Stuttgart, and Bremerhaven, none of which have been approved. They provide little more than general information, and it is questionable whether unneeded facilities will be identified when the plans are complete."

Further indication of problems in facilities planning in the Army can be obtained from the House Appropriations Committee Report on the Military Construction Appropriation for 1979. The committee report specifically mentions two MCA projects for which the funds were either reduced or deleted, because of inadequate facilities planning and utilization data.

Inadequacy of Performance Measures

Various indicators of RPMA performance are used by MACOM's to gauge effectiveness, although no consistent set of performance measures has been developed and applied. In an attempt to assess facilities engineering operations, DARCOM's Installation and Services Activity rated installations in terms of management of FE resources, condition of facilities, and resource sufficiency. The rating system is subjective, with rating points established on the basis of relative importance of criteria and responsibility. Of the 17 facilities surveyed in 1977, nearly 38% were given below-average ratings.

The TRADOC engineer utilizes several indicators to measure installation performance. Exhibit VII-2 shows an example of fire damage reports by installation over a three-year period. These data are utilized to measure the effectiveness of existing fire prevention programs and to identify the need for additional programs. Other performance indicators include comparison of each installation's engineering and other BASOPS staffing levels to MACOM averages.

The Annual Summary of Operations (Red Book) published each year by OCE provides historical data on RPMA expenditures by detailed account category. While these data provide useful insights in gauging efficiency, the indicators are not in themselves conclusive measurements of RPMA effectiveness. The Red Book data indicate highly varying costs for specific RPMA accounts among installations of similar size and in the same labor cost market. For example, FY 76 data show that the annual cost per square foot for the contract cleaning of approximately 1.2 million square feet of space in each of the following facilities amounted to:

Ft. Hood	$.317
Ft. Sam Houston	$.374
Ft. Bragg	$.507
Ft. Knox	$.481

Apparently, no effort is made to explain why these cost differences exist. Without adequate indicators of performance in the present sys-

TRADOC FIRE DAMAGE REPORT

TRADOC FIRE TOTALS
AS OF 7 OCT 77

Courtesy of ATEN-RAG

Installation	1 June 75 - 31 May 76	1 June 76 - 31 May 77	1 June 77 to date
APH	$767.00	$4,787.00	$3,187.00
BEL	$69,899.00	$20,263.00	$80,076.00
BEN	$757,565.00	$105,692.00	$109,656.00
BLI	$37,918.00	$668,565.00	$103,989.00
CAR	$0.00	$400.00	$0.00
CHA	$35,265.00	$983.00	$0.00
DIX	$38,285.00	$44,751.00	$21,116.00
EUS	$4,000.00	$13,307.00	$209.00
GOR	$20,092.00	$195,146.00	$106,295.00
HAM	$3,096.00	$12,791.00	$0.00
HAR	$250.00	$8,337.00	$0.00
JAC	$6,035.00	$183,176.00	$86,324.00
KNO	$82,574.00	$177,747.00	$31,615.00
LEA	$4,634.00	$56,897.00	$33,702.00
LEE	$63,721.00	$1,222,351.00	$51,047.00
MCC	$16,228.00	$76,343.00	$82,166.00
MON	$177.00	$450.00	$5,433.00
ORD	$41,260.00	$0.00	$70,130.00
PIC	$0.00	$2,165.00	$0.00
PLK	$0.00	$0.00	$13,637.00
RUC	$23,979.00	$12,266.00	$3,731.00
SIL	$24,675.00	$62,456.00	$10,356.00
STO	$0.00	$1,088.00	$0.00
LWD	$33,156.00	$789,989.00	$45,029.00
TRADOC	$1,264,516.00	$3,657,950.00	$857,798.00

EXHIBIT VII -2

tem, it is difficult to determine which installations or MACOM's are performing most effectively. In a system as large as the Army's, some consistent set of management indicators is needed to highlight problem areas for corrective action.

Presently, below-standard performance can go undetected for considerable lenghts of time, with serious adverse cost impacts. For example, audit reports have shown that lax preventive maintenance programs have resulted in severely deteriorated utility systems which will require extensive repair.

At the present time, extensive data are collected on RPMA performance. However, the data are, for the most part, not available in a form that is useful to management. A set of analytical performance indicators, using this existing data base, is required to (1) determine the relative effectiveness of RPMA in MACOM's and installations, (2) determine the relative effectiveness of current RPMA programs, (3) create a competitive environment for efficient execution of RPMA Army-wide, and (4) provide a means of allocating scarce resources more effectively.

Lack of Credibility Regarding Resource Requirements

At the Congressional level, there is increasing emphasis on providing additional justification for RPMA and other BASOPS requirements. In the past, the Army has been unable to express RPMA requirements in terms of priorities and mission requirements and to evaluate trade-offs among RPMA investment alternatives, showing their impact on mission. The effectiveness of the current RPMS is diluted by the difficulty of displaying the current program effectively at levels above DA, according to the Phase I study findings.

The Senate Committee on Appropriations has required DOD to submit an annual report on domestic military installations, containing base operating support (BOS) cost data (including RPMA) for installations grouped into similar mission categories. The factors include gross indicators of resource utilization of real property, such as annual BOS costs per unit of personnel and per unit of facility space, etc. The data submitted by the Army for FY 76 showed significant inefficiencies in utilization of BOS resources. The Senate Committee found the Army, in particular, to be unresponsive to questions concerning apparent BOS inequities. The Committee also found that Army responses concerning resource utilization conflicted with the data submitted.

Exhibit VII-3, presents an example of data supplied to the Committee by the Army. For the mission category "Specialized Skill Training," Ft. Sill shows a BOS cost of $7.42 per square foot, which is 64% higher than the $4.51 per square foot reported for Ft. Bliss. Both facilities are in the Southwest and are of similar size in terms of square footage of facilities.

EXAMPLE OF BOS COST DATA

UNCLASSIFIED

Mission=x103xx - Specialized Skill Training

DEPARTMENT OF DEFENSE
DOMESTIC BASE FACTORS REPORT
CENTRAL SUPPORT FORCES - TRAINING, MEDICAL AND OTHER PERSONNEL PROGRAMS - IDPP CATEGORY 500
PART IIIB -- SELECTED INSTALLATION MANAGEMENT INDICATORS
FY 1977

Service: ARMY

March 25, 1978

1	2	27 FYDP Cost		28 BOS Cost		29 BOS Cost		30 BOS Cost		31 Msn Pers	
Installation	ST	Msn Pop ($/Pers)	RK	Msn Pop ($/Pers)	RK	Bldg Area ($/GSF)	RK	BOS Pers ($/Pers)	RK	BOS Pers (Ratio)	RK
MCCLELLAN, FORT	AL	29577.635	7	5413.725	9	8.077	12	15282.576	2	3.352	9
MONTEREY, PRESIDIO OF	CA	2703.212	1	389.916	1	1.722	1	32924.242	13	83.712	1
GORDON, FORT	GA	18971.703	3	3348.344	3	6.628	6	17728.766	6	5.789	4
BENNING, FORT	GA	39179.485	13	6364.238	11	5.965	4	16953.678	4	3.804	11
HARRISON, FT BENJAMIN	IN	30396.200	8	5242.351	8	7.614	11	17697.822	5	3.455	7
KNOX, FORT	KY	24620.868	5	4077.403	4	6.063	5	17805.429	7	5.174	5
DEVENS, FORT	MA	31923.287	9	6100.681	10	6.873	7	20392.488	10	3.254	10
HAMILTON, FORT	NY	39331.654	12	7806.371	14	10.923	14	50021.667	14	6.564	3
SILL, FORT	OK	27085.690	6	4717.385	6	7.424	9	16156.429	3	3.929	6
BLISS, FORT	TX	21764.407	4	4330.129	5	4.558	2	11965.443	1	2.911	13
SAM HOUSTON, FORT	TX	12891.859	2	2369.922	2	4.991	3	18078.769	8	9.186	2
EUSTIS, FORT	VA	52938.745	14	7597.564	12	9.269	13	21095.075	12	2.791	14
LEE, FORT	VA	33016.303	10	5238.589	7	7.189	8	19067.450	9	3.796	8
BELVOIR, FORT	VA	38789.980	11	7633.742	13	7.448	10	20792.794	11	2.998	12
no.selected		14.000		14.000		14.000		14.000		14.000	
present		14.000		14.000		14.000		14.000		14.000	
missing		0.000		0.000		0.000		0.000		0.000	
sum		402891.430		70600.758		94.693		295952.610		139.243	
max		52938.745		7806.371		10.923		50021.667		83.712	
min		2703.212		389.916		1.722		11965.443		2.791	
average		27024.185		4700.575		6.531		17767.447		4.150	
median		29987.017		5240.470		7.031		17949.094		3.826	
std.dev		12484.427		2097.445		2.143		9538.649		21.292	

EXHIBIT VII-3

Because of apparent inconsistencies, the Committee performed its own statistical analysis of BOS costs, which resulted in a recommendation for reduction of funding. The Committee's action resulted in the issuance of a directive governing all future budget submissions, which were to incorporate the following:

- Establishment of a uniform definition of BOS.
- Definition and use of uniform work load and performance measures of BOS.
- Establishment of reasonable BOS costs per unit.
- Provision of military construction plans for all installations.

Congress has concluded that the cause of the growing backlog of real property maintenance is due to the practice of reprogramming maintenance funds into other operational activities. This, in turn, results in a greater requirement for new facilities due to the deterioration of existing facilities caused by inadequate maintenance.

The House of Representatives' May 24, 1978 committee hearings on the Military Construction Appropriation Bill, 1979 contains the following statements:

> "The committee has been very concerned over the years that the Department is not directing sufficient resources to maintain its real property. This concern is reinforced by the fact that the backlog of real property maintenance and repair has been increasing in recent years. ...One of the principal reasons the backlog of real property maintenance is increasing is because the Services continue to reprogram maintenance funds into other operational activities..."

Congress has requested DOD to provide a standard approach to measuring the backlog of real property maintenance for all Services that identifies the backlog of repair and maintenance work for permanent and temporary facilities. Previous attempts by Government auditing agencies to validate reported Army backlogs of maintenance and repairs have revealed that supporting documentation was inaccurate, incomplete, or missing.

Congress is reducing the FY 79 military construction budget by $7.9 million to underscore its view that greater emphasis needs to be placed on the maintenance of facilities.

Declining Resources and Increasing Work Load

The work load of the FE is broadly based, including many functions. Although these functions have always been the responsibility of the FE, the mix of his work load has changed as the result of increased demands re-

sulting from energy conservation, environmental activities and safety and traffic management functions. Also, the Army real property facilities are aging and deteriorating, making necessary an increase in repair and maintenance in order to keep facilities in usable condition.

The high cost of energy has required intense management and control of energy consumption and the development and installation of energy control and monitoring devices. For example, FE man-hours devoted to energy and environmental activities have increased by nearly 40% betweed FY 77 and FY 78, according to survey data presented in the Phase I study report. While the work load and its complexity have steadily increased, the FE work force had remained relatively static since FY 74. At present, the FE work force at an installation averages approximately 300, including both permanent and temporary employees. Actual work force counts are approximately 25% to 30% below recognized staffing requirements. As a result, increased use of contract services has been required to accomplish FE work.

The shortfall between work load and the personnel complement is expected to increase at an even greater rate in the future, because of personnel reductions. Even if requirements do not increase, the trend, as indicated in Exhibit VII-4, will result in an additional shortfall of 2,700 spaces in 1980.

The problem of declining resources is greatly intensified when resource needs are analyzed in terms of critical technical functions. For example, at many installations, there is a shortage of trained staff to perform the following activities:

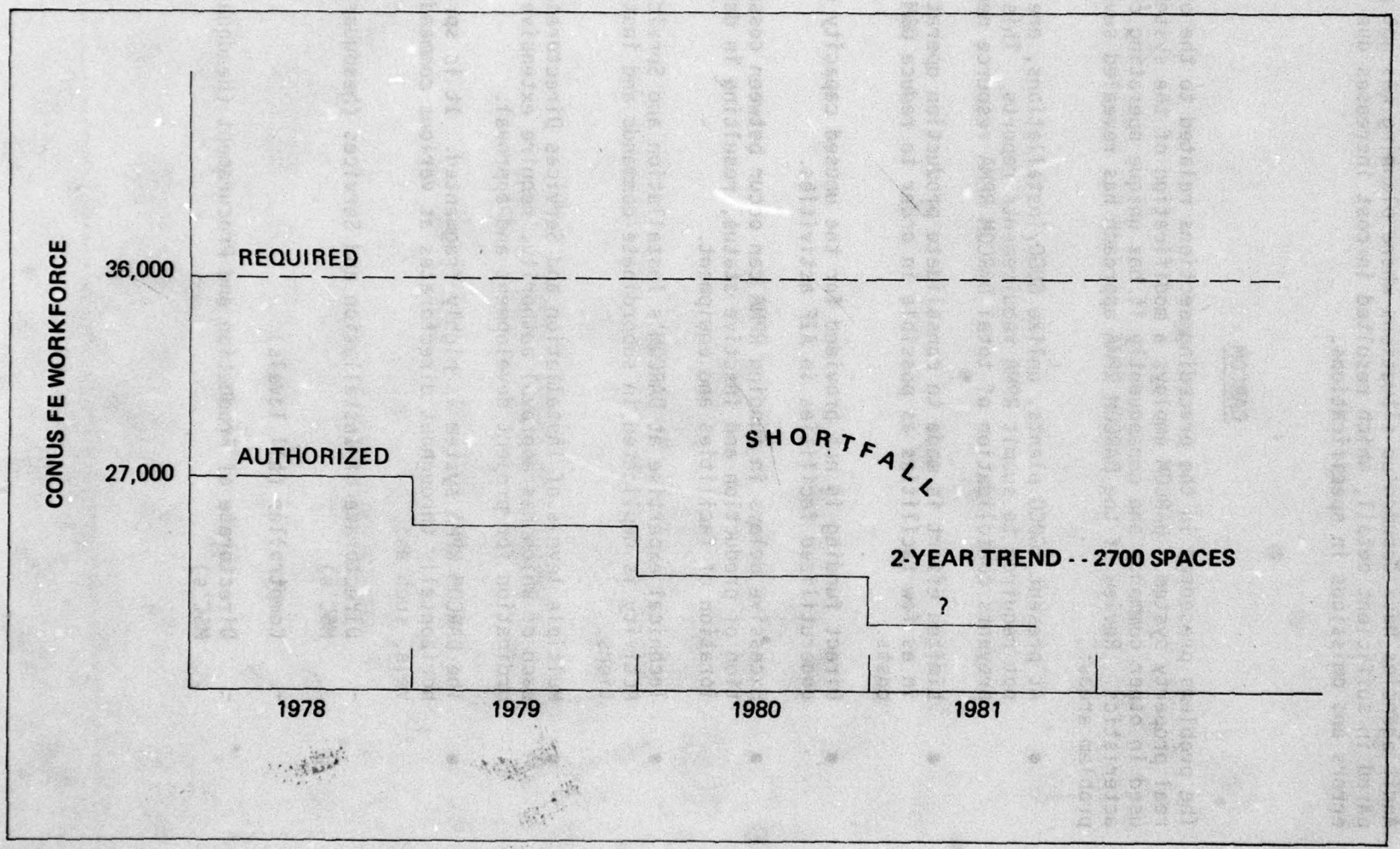
- Contract specification writing.
- Contract performance inspection.
- Performance review and analysis (industrial engineer).
- Supervision of craft workers.
- Performance of specialized functions in the areas of energy, environmental protection, historical preservation, OSHA, etc.

The shortage of trained staff is even more critical now that DOD has initiated expanded contracting-out of RPMA functions. There is an even greater need for more professional expertise in contract management.

At most installations, a technical capability exists for design, drawing preparation, and writing of specifications for facility engineering projects. Approximately 76% of engineering design support is provided in-house.

Because of the increasing demands on limited FE personnel resources, sufficient time and expertise are often not available for the develop-

CONUS RPMA MANPOWER TREND



SOURCE: ENGINEER STUDIES CENTER

EXHIBIT VII-4

ment of solid engineering design concepts for proposed major projects. Audit agencies have documented situations where planning was not prepared in sufficient detail, which resulted in cost increases due to errors and omissions in specifications.

DARCOM

The problems presented in the preceding sections related to the overall real property system. DARCOM employs a modification of the system used in other commands and consequently it has unique operating characteristics. Review of the DARCOM RPMA approach has revealed several problem areas:

- At present, GOCO plants, unlike GOGO installations, are not required to submit RPMA requirements reports. This prevents consolidation of total DARCOM RPMA resource needs.
- Limited effort is made to consolidate production operations in as few facilities as possible in order to reduce O&M costs.
- Direct funding is not provided for the unused capacity of underutilized facilities in AIF activities.
- Excessive delays in funding RPMA can occur between cessation of production and inactive status, resulting in deterioration of facilities and equipment.
- Technical expertise at DARCOM's Installation and Services Activity is duplicated in subordinate commands and installations.
- Multiple levels of Installation and Services Directorates, each of which has approval authority, require extensive coordination for project development and approval.
- The DARCOM RPMA system is highly fragmented. It is spread horizontally throughout directorates at various command levels, such as:
  - Directorate of Installation and Services (headquarters, MSC's)
  - Comptroller (all levels)
  - Directorate of Production and Procurement (headquarters, MSC's)

- Directorate of Industrial Readiness (MSC's)
- Facility Engineering Division (installations)

- In DARCOM, OCE is not the proponent for the operation and maintenance of real properties when funded by RDT&E or of inactive GOCO plants

Summary

The O&M component of the RPMS conforms basically to the Army's organization philosophy of decentralization. The planning and execution of real property maintenance is managed through the MACOM's, with OCE providing policy and technical guidance at the DA level. O&M is a supporting function to the MACOM's in the execution of their mission objectives of training and housing troops, production of ordnance, logistics supply, etc. The management system is not designed to optimize the utilization of Army real property assets--in fact, mission priorities typically override real property maintenance objectives.

Installation commanders have the authority to decide how installation objectives can best be attained by transferring resources between mission activities and base operation activities (including RPMA). For this reason, the system for operation and maintenance of facilities is vulnerable to the immediacy of short-term Army mission priorities which can compromise the attainment of long-term objectives for preservation of Army assets.

The organization concept for RPMA inherently creates problems in its management, because of the conflicts of mission and RPMA objectives and the organizational separation of policy and technical guidance from execution and overall facility management.

VIII. EVALUATION OF ALTERNATIVES

VIII. EVALUATION OF ALTERNATIVES

In addition to the present Army Command Management System, there are a number of organizational alternatives for the management and direction of Real Property Maintenance Activities. However, each organizational option can be generally classified as one of the following types:

- Decentralized Organization - In a totally decentralized organization, resources are allocated to installation commanders, with the use of these resources left largely to their discretion. The conceptual framework of a decentralized organization includes delegation of authority, responsibility, and accountability to the lowest organizational level in which there is sufficient competence, information, and perspective for effective decision making on task performance.

  The current Army Command Management System most closely exemplifies a decentralized organizational concept. Within the constraints of various regulations and directives, the installation commander has a high level of discretionary authority with respect to the employment of RPMA personnel and financial resources.

- Service-Oriented Organization - Such an organization provides facilities engineering services to each installation commander on a reimbursable basis. It would be the responsibility of the commander to identify the requirements and request that the necessary work be performed. The service-oriented organization concept could be established within the existing organizational framework. For example, the existing MACOM structure could be utilized to provide RPMA services, as could the Corps of Engineers or some other existing entity within the Department of the Army.

- Functional Organization - With this type of approach, the activities of the facilities engineer would be included in a real property management organization that would construct, manage, and maintain the facilities. The installation commander would be relieved of responsibility for and control of RPMA resources and would become dependent upon the functional organization for the real property facilities services required at an installation.

  The functional organization would be responsible for Army real property and would be directly funded for the resources required to operate and maintain these facilities as it determined those requirements.

  The functional organization structure could also be established within the existing Army framework. For example,

total responsibility for RPMA could be assigned to the MACOMs, a single MACOM, or the Corps of Engineers.

Although there are numerous sub-options to the three general organization structures, the practical alternatives for the organizational alignment of Real Property Maintenance Activities that warranted in-depth analyses were narrowed to the following:

- Present Command Management System
- "Stovepipe" to MACOM
- "Stovepipe" to Corps of Engineers
- Engineer command utilizing a revolving fund

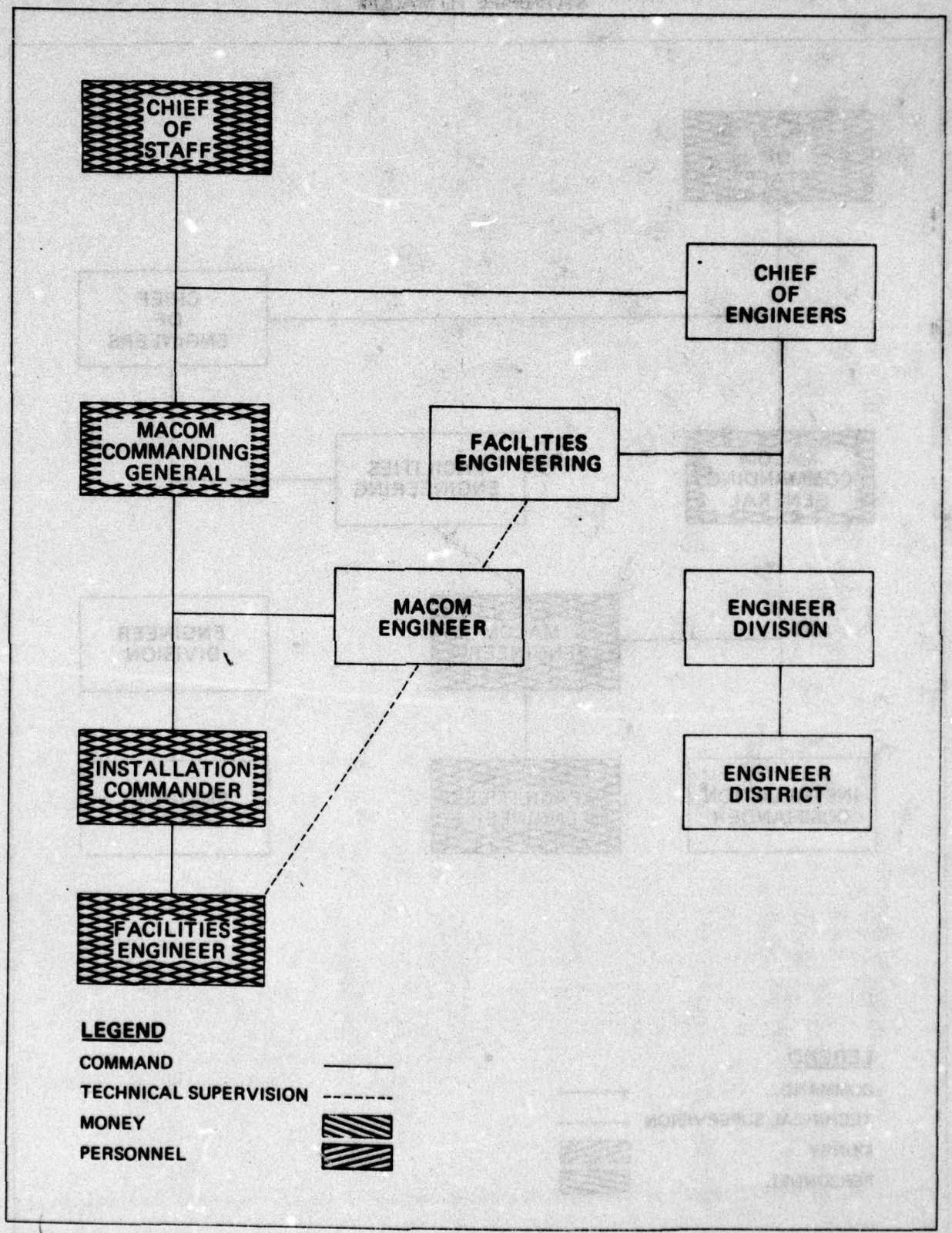
The present Army Command Management System. Under the present system, responsibility and authority for RPMA are delegated largely to major commands and installations. The facilities engineer, as a staff member at each level of the command, has technical and execution responsibility for RPMA functions under the authority of the commander. Financial resources are controlled within the command management chain. The commanders have some flexibility in the allocation of these funds to real property activities. Because of the flexibility, commanders can balance the requirements of individual components (RPMA, supply, housing, etc.) with the requirements of mission. Exhibit VIII-1, following this page, presents a chart depicting this organizational concept.

"Stovepipe" to MACOM. In this option, depicted in Exhibit VIII-2, a functional organization for the operation and maintenance of facilities would be established within the MACOM structure. MACOM installation FE's would report directly to their respective MACOM engineers. The MACOM engineering organization would be responsible for allocating personnel and financial resources to their reporting installations. The FE would no longer report to the installation commander, and the commander would lose the flexibility of using RPMA resources to satisfy other operational needs.

"Stovepipe" to Corps of Engineers. This option would utilize the existing Corps of Engineers division/district structure as the functional organization responsible for RPMA. The installation FE would become a member of the Corps of Engineers management structure. Responsibility for RPMA functions would rest with engineers at each level of the engineering organization and ultimately with the Chief of Engineers. All RPMA resources (both dollars and personnel) would be removed from the chain of command and would be vested in the Corps of Engineers. The installation commander would become totally dependent upon the Corps of Engineers for RPMA. An organization chart for this concept is shown in Exhibit VIII-3.

EXHIBIT VIII-1

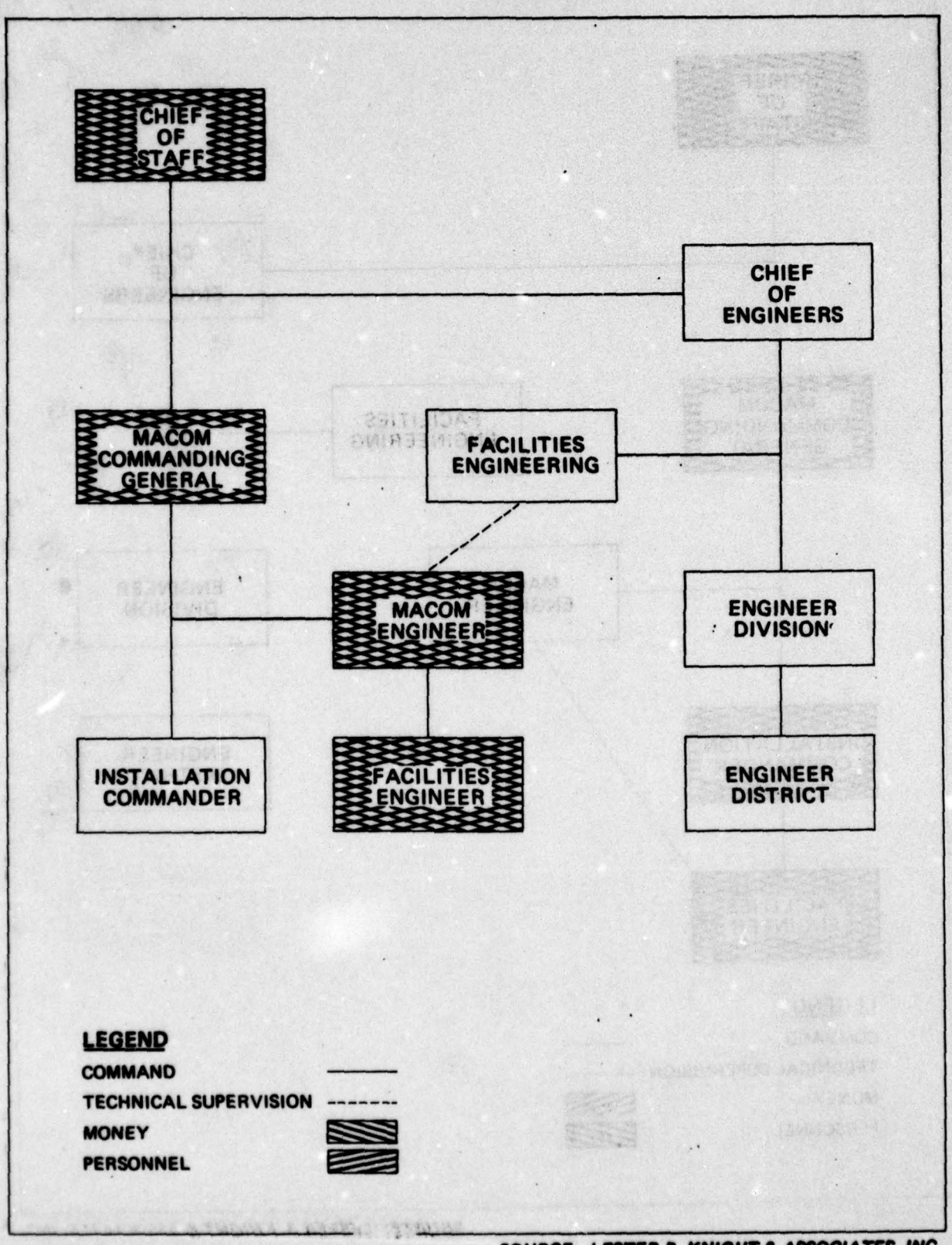
PRESENT COMMAND MANAGEMENT SYSTEM



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

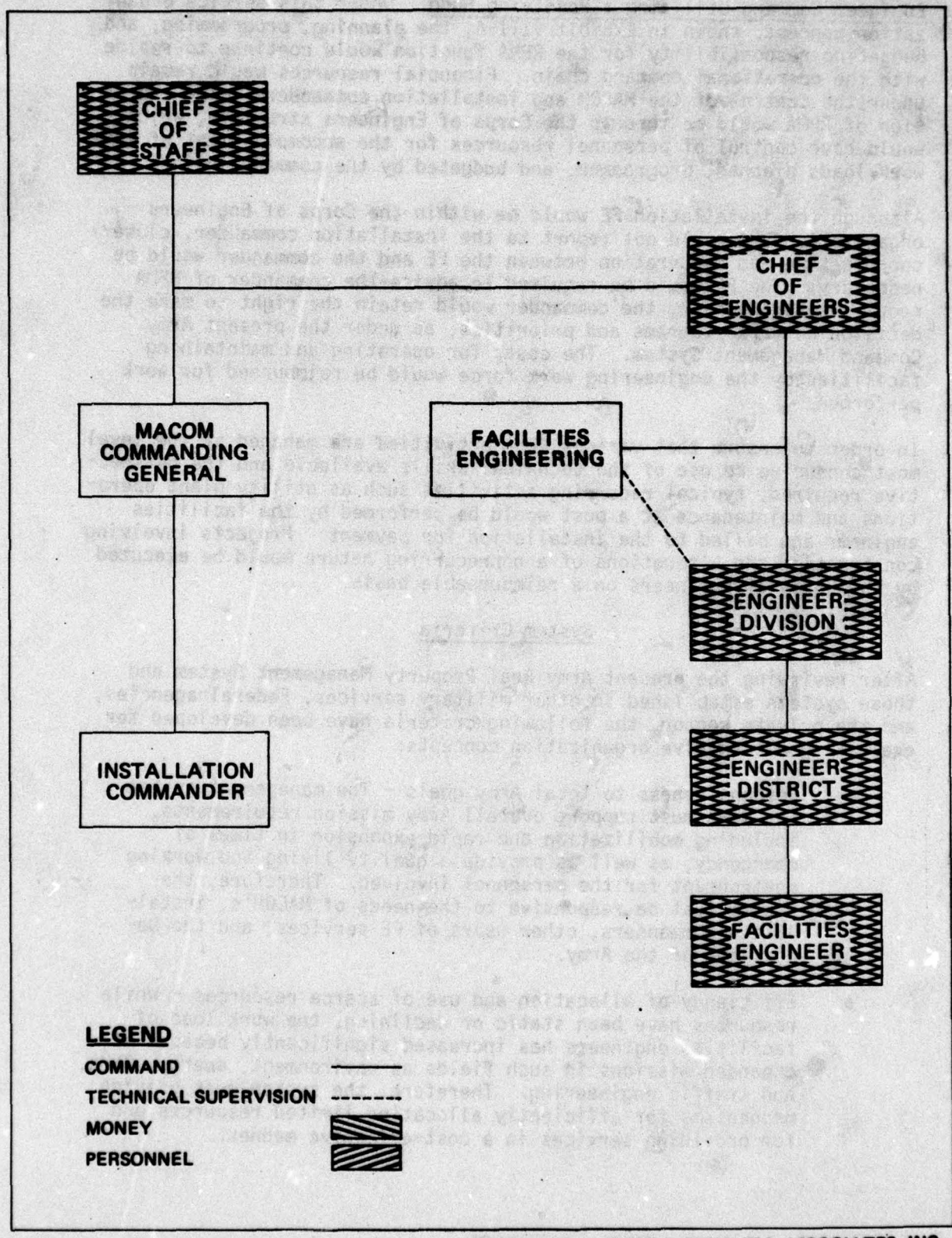
EXHIBIT VIII-2

STOVEPIPE TO MACOM



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

STOVEPIPE TO CORPS OF ENGINEERS



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

Engineer Command Utilizing a Revolving Fund. Under this service organization concept, shown in Exhibit VIII-4, the planning, programming, and budgeting responsibility for the RPMA function would continue to reside with the operational command chain. Financial resources would remain under the control of the MACOM and installation commanders. The execution of RPMA would be through the Corps of Engineers structure, which would have control of personnel resources for the accomplishment of RPMA work loads planned, programmed, and budgeted by the command chain.

Although the installation FE would be within the Corps of Engineers organization and would not report to the installation commander, close coordination and cooperation between the FE and the commander would be necessary. The FE would be required to advise the commander of RPMA requirements; however, the commander would retain the right to make the decision on work programs and priorities, as under the present Army Command Management System. The costs for operating and maintaining facilities by the engineering work force would be reimbursed for work performed.

In order to ensure that various RPMA activities are managed at the level most conducive to use of the technical skills available and the perspective required, typical recurring activities such as utility plant operations and maintenance at a post would be performed by the facilities engineer and billed to the installation for payment. Projects involving construction and alterations of a nonrecurring nature would be executed by the Corps of Engineers on a reimbursable basis.

System Criteria

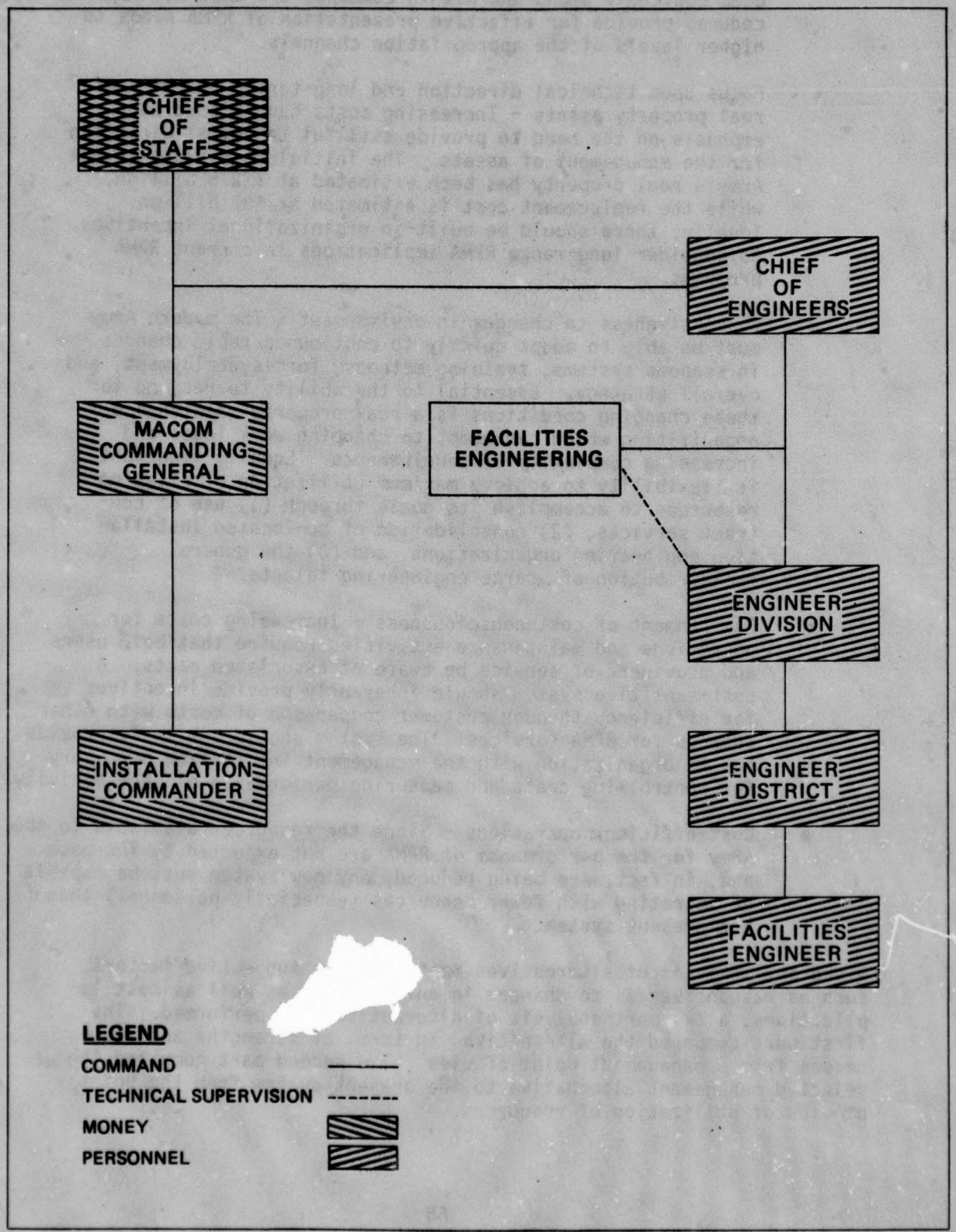
After reviewing the present Army Real Property Management System and those systems established in other military services, Federal agencies, and the private sector, the following criteria have been developed for evaluating alternative organization concepts:

- Responsiveness to total Army goals - The management system for RPMA must support overall Army mission requirements, including mobilization and rapid expansion in times of emergency, as well as provide a quality living and working environment for the personnel involved. Therefore, the system must be responsive to the needs of MACOM's, installation commanders, other users of FE services, and the Department of the Army.

- Efficiency of allocation and use of scarce resources - While resources have been static or declining, the work load of facilities engineers has increased significantly because of expanded missions in such fields as environment, energy, OSHA, and traffic engineering. Therefore, the system must provide mechanisms for efficiently allocating limited resources and for providing services in a cost-effective manner.

EXHIBIT VIII-4

ENGINEERING COMMAND CHAIN UTILIZING A REVOLVING FUND



SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

Further, the system should ensure that resources are distributed equitably among and within commands and that sound procedures provide for effective presentation of RPMA needs to higher levels of the appropriation channels.

- Focus upon technical direction and long-term protection of real property assets - Increasing costs have placed added emphasis on the need to provide skillful technical direction for the management of assets. The initial investment in the Army's real property has been estimated at $22.6 billion, while the replacement cost is estimated at $80 billion. Ideally, there should be built-in organizational incentives to consider long-range RPMA implications in current RPMA programs.

- Responsiveness to changes in environment - The modern Army must be able to adapt quickly to continuous rapid changes in weapons systems, training methods, forces deployment, and overall strategy. Essential to the ability to respond to these changing conditions is a real property maintenance organization which can adapt to changing work loads and increasing complexity of requirements. Equally important is flexibility to achieve maximum utilization of existing resources to accomplish its goals through (1) use of contract services, (2) consolidation of co-located installation engineering organizations, and (3) the general redistribution of scarce engineering talents.

- Environment of cost-consciousness - Increasing costs for operations and maintenance activities require that both users and providers of service be aware of associated costs. A cost-sensitive system should inherently provide incentives for efficiency through customer comparison of costs with other sources for RPMA services. The system should similarly provide the FE organization with the management information necessary for controlling costs and measuring performance of each activity.

- Cost-efficient operations - Since the resources available to the Army for the performance of RPMA are not expected to increase and, in fact, are being reduced, any new system must be capable of operating with fewer resources (especially personnel) than the present system.

Since any analysis of alternatives must consider subjective factors, such as responsiveness to changes in environment, as well as cost implications, a two-part analysis of alternatives was performed. The first part compared the alternatives in terms of strengths and weaknesses from a management point of view. The second part compared the selected management alternative to the present system from the point of view of utilization of resources.

Strengths and Weaknesses

Present Army Command Management System

The present ACMS provides for a decentralized approach to real property management by authorizing installation commanders to make decisions regarding the allocation and utilization of RPMA resources in the accomplishment of installation mission objectives.

Although installation commanders are constrained by regulations and statutes in the use of their RPMA funds, the current system lacks effective built-in incentives to emphasize long-term aspects of RPMA. RPMA requirements are subordinate to the primary Army mission and may not be adequately accomplished because of overriding mission requirements.

The present system is designed to provide for a high degree of responsiveness to customer needs. However, responsiveness needs to be measured in terms of capability as well as willingness. Therefore, over time, the trend toward personnel reduction and the resulting scarcity of technical skills will retard system responsiveness.

The present system encourages the accomplishment of short-range objectives at each installation. However, there is no assurance that long-term preservation of Army-wide real property assets will be maintained by the present management structure. The system has not been responsive to meeting requirements for major repairs and maintenance at installations, as indicated by the currently reported backlog. Indeed, many new facilities are being constructed as replacements for some in deplorable condition - caused in part by inadequate maintenance. While it is difficult to prove that the existing system has failed, Section VII of this report indicates that it is not at all difficult to demonstrate that the existing system is not as efficient and productive as it could be.

As resources tend to erode due to inflation and reductions in personnel levels, and as increasing demands are imposed on the system, the ability of the present system to provide satisfactory services is highly questionable. There is little internal incentive to consolidate FE organizations of co-located facilities across MACOM's. Commanders are generally reluctant to relinquish such a large part of their BASOPS responsibilities. Pooling of existing scarce technical engineering personnel resources available to the Army in MACOM headquarters, facilities engineering divisions, and Corps of Engineers divisions and districts to provide quality RPMA programs has not been realized under the present organizational concept.

Decentralization, rather, has resulted in spreading an already thin engineering services capability across all installations. In addition, the present structure has fostered piecemeal contracting out of services on a case-by-case basis and has, in general, inhibited the development and use of consistent performance measures to gauge the effectiveness

of RPMA. With the present system of multiple management levels of RPMA, many functions such as technical review, approval, and oversight are performed at several levels. In the present organization, staffs at DA, MACOM's, major subordinate commands, installations, and sub-installations are all involved in some of these review activities.

In summary, the present system is not an optimum alternative, since its organization concept does not ensure the meeting of RPMA criteria which this study has determined to be necessary in a preferred system. The present system does not provide the proper balance among the basic criteria indicated below:

- Responsiveness to Army mission goals while preserving and maintaining real property assets.
- Efficient allocation and use of scarce RPMA resources, Army-wide.
- Establishment of RPMA objectives and performance measurement to meet desired goals.

"Stovepipe" to MACOM

This alternative represents a functional organization for RPMA services administered by the MACOM's. The FE at the installation would report to the MACOM engineer, who would control all RPMA resources (in theory, the coordination of RPMA requirements could be integrated at MACOM level). The installation commander would no longer have the authority to decide how RPMA funds are to be used. This alternative should improve the use of RPMA resources within the MACOM, since the MACOM engineer would have the authority to allocate and reprogram RPMA resources.

RPMA technical direction and quality should improve as the result of this centralized RPMA management concept administered at MACOM level. The potential consolidation of available engineering resources now located at the installations into a centralized MACOM support group should enhance the quality of technical engineering services and reduce costs.

This alternative could potentially decrease system responsiveness to customer requirements, since management of the system is not at the installation level. In addition, the ability of the installation commander to control resources for accomplishment of his mission is somewhat reduced, since the commander's direct involvement in RPMA resources is eliminated. These two disadvantages are inherent in all "stovepipe" organizations. (Because of the geographical distance between MACOM headquarters and field units, it may be necessary to establish MACOM regional offices to ensure an adequate level of system responsiveness.)

In any event, no one organization would be responsible for the Army-wide management of real property. Each MACOM engineering organization

would be responsible for RPMA execution, with technical guidance emanating from OCE, as at present.

"Stovepipe" to CE

This alternative would provide a functional engineering chain of command which would be responsible for the operation and maintenance of all Army installations. Under this concept, all RPMA funding and space authorizations for facilities engineering would be provided through the Corps of Engineers to the facilities engineer at each installation. The facilities engineer would report directly to the Corps of Engineers and not to the installation commander or MACOM engineer, as illustrated in Exhibit VIII-3. The Army commands would no longer be directly involved in day-to-day execution of RPMA activities, but rather would, in effect, rely totally on the Corps of Engineers for real property asset management, including acquisition, programming, budgeting, operations and maintenance, and disposal.

This concept of organization has several major advantages. Most important, the concept provides the vehicle for optimum utilization of personnel resources, since the capabilities existing in the Corps of Engineers division/district organization could be used in conjunction with existing FE staff at installations and MACOM's to provide for more effective RPMA execution. The geographical distribution of the Corps of Engineers present division/district organization and special project offices would provide a ready means of pooling existing technical engineering expertise to service multiple installations without decreasing system responsiveness.

Other advantages include greater incentives to consolidate facilities engineering organizations with those of nearby installations, provision of standards and policy for contracting-out of services, and improved overall technical direction. In addition, this organizational concept provides for a clear line of responsibility for RPMA activities and furnishes increased opportunities for establishing a career field path for facilities engineers.

The primary disadvantage of this concept is that it could potentially be less responsive to mission and customer requirements, since neither the MACOM nor installation commanders would be involved in RPMA management. This alternative would require the Corps of Engineers to plan, program, budget, and allocate all resources for RPMA. While this has certain advantages, there is a risk of not being able to accomplish this task without seriously impacting the ability of the MACOM's to accomplish their mission objectives. Reportedly the two major problems with "stovepipe" systems that were utilized in the Navy, USAREUR, and industry were decreased responsiveness and flexibility. These necessary components can, however, be built into the "stovepipe" concept. The methods to accomplish this include:

- Requiring liaison between the facilities engineer and the installation commander in the identification of requirements and changes in RPMA objectives due to mission considerations.

- Providing the installation commander with a small engineering staff to handle unforeseen requirements and to identify mission needs.

- Increasing the liaison between MACOM management and Corps of Engineers management to integrate mission and RPMA requirements.

- Continuing to have the FE rated by the installation commander and endorsed and reviewed by CE division/district engineers.

Engineer Command Using a Revolving Fund

Under this concept, the Corps of Engineers would be responsible for execution of RPMA, as in the Corps of Engineers "stovepipe" organization; however, installation FE personnel would report directly to CE division and district personnel. The MACOM and installation commanders would still be provided with funds to purchase required services at the installation level. This concept is illustrated in Exhibit VIII-4.

The Corps of Engineers would control all RPMA manpower resources and would be responsible for their effective use. The MACOM's and installation commanders would retain responsibility for RPMA monetary resources, as well as for RPMA planning, program, budgeting, and priority setting. The FE organization would assist the installation in identifying requirements, but authority for the ultimate decision would remain with the command chain.

The installation would purchase RPMA services from the Corps of Engineers through a revolving fund for services of a recurring nature, such as utility operations, maintenance, custodial services, etc. Major repair projects, alterations, and new construction would be executed project by project by the Corps of Engineers on a reimbursable basis.

Use of a revolving fund at an installation would provide the vehicle for retaining the RPMA system's responsiveness objectives. Incentives for cost-consciousness on the part of both customers and the FE staff would be provided through use of a cost accounting system to capture the cost of each work order and bill the customer. This system would serve to identify the full cost of services and facilitate cost-conscious decision-making. It has been the experience of the Navy that full cost identification has resulted in a 10% decrease in total discretionary requirements.

The overall advantages of this concept include optimum use of scarce engineering resources through consolidation of technical expertise at a level above the installations, and improved technical guidance for RPMA through an engineer command.

The use of a revolving fund would provide a mechanism for balancing mission objectives and customer requirements with RPMA goals through both cost identification and the definition of those RPMA programs that are required to maintain and operate installations so as to preserve the Army's investment in real property. The use of the revolving fund concept would provide for easier consolidation of facilities engineering organizations at nearby installations to improve the use of personnel resources.

The primary disadvantages of the concept include an initial startup cost for establishing the revolving funds and the added personnel needed in accounting and administration to manage increased accounting functions dictated by the use of revolving funds. Navy experience with industrial funding in their Public Works Centers indicates that additional staffing for billing, overhead rate calculations, cash management, receivables monitoring, etc. has not been excessive, providing adequate computer support is available for these functions.

Summary

Exhibits VIII-5 through VIII-8 provide a summary of the advantages and disadvantages of the present system and the proposed alternative concepts discussed in this section.

Ranking of Alternatives

To identify an optimum system, an attempt has been made to rank the alternative concepts numerically, relative to the present system. Exhibit VIII-9 contains a list of criteria, along with the number of points assigned to each factor to indicate its relative importance. For example, mission responsiveness is awarded the largest number of points (30) and is considered twice as important as cost identification and reporting. The assignment of points to each of the criteria is highly subjective. Each decision-maker would select his own rating scale; however, it is felt that these assigned values are reasonable and that slight shifts in the number of points assigned to the criteria would not alter basic conclusions.

The relative impact of each of the alternatives on the aforementioned criteria is assessed on a scale of -2 to +2. That is, if an alternative highly improves mission responsiveness relative to the present system, it would be awarded a +2 score. If it causes a marked decrease in responsiveness, it would be awarded a negative score such as -2. It is important to note that impact of an alternative on a criterion is based upon potential rather than actual impact. For example, under mission responsiveness, the current system, rather than representing a baseline of 0, could be assigned a negative score, indicating that the present system capability is being impaired by personnel reductions. Similarly, the "stovepipe" to CE is only potentially unresponsive. In actual practice, effective liaison could be established to improve responsiveness. Therefore, to simplify the analysis, only potential

STRENGTHS AND WEAKNESSES OF PRESENT ARMY COMMAND MANAGEMENT SYSTEM

STRENGTHS

1. The system is designed to be highly responsive to mission and mission changes.
2. Installation commanders can balance installation resources for RPMA and other BASOPS to accomplish mission objectives.
3. System is in place and functioning.

WEAKNESSES

1. Efficient allocation of total Army resources is difficult to attain.
2. It is difficult to measure system performance Army-wide.
3. There is a lack of long-term incentives for preservation of Army assets.
4. Top-level management responsibility is fragmented.
5. Decentralization philosophy requires large FE overhead staff at installations.
6. Trends in personnel reductions are reducing system capacity.

STRENGTHS AND WEAKNESSES OF "STOVEPIPE" TO MACOM

STRENGTHS

1. The system protects RPMA financial resources from reprogramming into mission or other base operating activities.
2. The system provides an opportunity for improved allocation of resources within MACOM's.
3. Overall technical direction for FE activities should improve.

WEAKNESSES

1. Installation commander loses control of RPMA resources and ability to set priorities.
2. Potentially less responsive to customers.
3. Geographical distance between MACOM's and installations could decrease system responsiveness.
4. No one functional organization is responsible for Army-wide RPMA.

STRENGTHS AND WEAKNESSES OF "STOVEPIPE" TO COE

STRENGTHS

1. The system provides an opportunity to optimize resource allocation.
2. Technical direction is increased.
3. There is a clear line of RPMA responsibility.
4. Career field opportunities for FE are improved.
5. Existing geographical organization could be used.
6. Consolidation and contracting out of FE services would be made easier.

WEAKNESSES

1. Commanders lose control of RPMA.
2. The system is potentially unresponsive to installation needs.
3. Major changes in organization and budgeting processes would be required.
4. Previous experience with totally "stovepiped" organizations in U.S. Navy and USAREUR were reportedly unsuccessful.
5. Major organizational changes are required.

STRENGTHS AND WEAKNESSES OF ENGINEERING COMMAND USING A REVOLVING FUND

STRENGTHS

1. The system would provide for integration of technical guidance and execution of RPMA for more efficient utilization of total engineering resources.
2. High degree of financial control and cost identification would be provided.
3. Commanders retain present control over RPMA planning and flexibility in funds allocation.
4. Contracting-out and consolidation of FE activities would be made easier.
5. A cost-conscious environment would be created.
6. Similar systems concepts are commonplace in the private sector.
7. Existing geographic organization could be used.

WEAKNESSES

1. Initial working capital is required.
2. Increased staff for accounting and revolving fund administration would be required.
3. Major organization changes are required.

RELATIVE IMPORTANCE OF RANKING CRITERIA

Points	Criteria
30	Mission responsiveness
25	Efficient allocation of RPMA resources
20	Technical direction and long-term incentives for RPMA
15	Cost identification, reporting, and financial control
10	Adaptability to changing environment (consolidations, contracting-out, etc.)
100	

impacts are judged. Exhibit VIII-10 shows the relative impact on each criterion under the three organizational alternatives and the present system.

Exhibit VIII-11 presents the total point score for each alternative after applying the relative weights of the individual criteria. For example, the MACOM "stovepipe" alternative produces a total of -30 points for the mission responsiveness criteria, as shown. This score is a result of multiplying its impact assessment of -1 (see Exhibit VIII-10) by 30, which is the number of points assigned to this criterion (as shown in Exhibit VIII-9). The scores of the various criterion categories were accumulated similarly for each of the alternatives.

The MACOM "stovepipe" alternative achieves the lowest score of the alternatives evaluated because of the negative impact on mission and customer responsiveness, with only minor positive improvements in other categories. The option of a "stovepipe" to CE has positive benefits in allocation of resources and overall technical direction. However, assessment of a substantial negative impact on mission responsiveness offsets, to a large degree, the positive attributes of this concept.

The revolving fund concept administered through an engineering command achieves the highest rating of the concepts, because of substantial benefits from improvements in resource allocation, technical direction, and cost identification and control. These positive benefits more than offset any potential impact on mission responsiveness resulting from the loss of control of RPMA personnel resources by the MACOM's.

It should be remembered that, under this alternative, dollar resources for RPMA would still reside with the installation commander, so shifts in mission objectives could be translated into RPMA objectives by altering work priorities. With RPMA personnel resources controlled by the Corps of Engineers, expanding and reducing work load requirements dictated by mission changes could be dealt with by reallocation of personnel to ensure timely completion of work plans.

Because of the overall management benefits provided by the engineering organization concept utilizing a revolving fund, it is considered that this framework is the best alternative to the present system.

Resource Analysis

The initial part of the evaluation of alternatives analyzed organization concepts in terms of strengths and weaknesses from a system management point of view. The results of that analysis indicated that an engineer command utilizing a revolving fund is superior to the present command management system as a management approach for RPMA. However, since RPMA personnel resources are in fact declining, the revolving fund alternative must also be demonstrated to be superior from the stand-

RELATIVE IMPACT OF ALTERNATIVES ON CRITERIA

CRITERIA	"STOVEPIPE" TO MACOM	"STOVEPIPE" TO OCE	REVOLVING FUND ENG. COMMAND CHAIN
Mission Responsiveness	-1	-2	-1
Allocation of Resources	+1	+2	+2
Technical Direction	+1	+2	+2
Cost I.D. and Financial Control	+1	+1	+2
Adaptability to Changing Environment	+1	+1	+1

WEIGHTED SCORE OF ACTIVITIES

CRITERIA	"STOVEPIPE" TO MACOM	"STOVEPIPE" TO OCE	REVOLVING FUND (ENG. COMMAND)
Mission Responsiveness	-30.0	-60.0	-30.0
Allocation of Resources	+25.0	+50.0	+50.0
Technical Direction	+20.0	+40.0	+40.0
Cost I.D. and Financial Control	+15.0	+15.0	+30.0
Adaptability to Changing Environment	+10.0	+20.0	+20.0
TOTAL	40.0	65.0	110.0

point of utilization of resources. Therefore, the comparative personnel resource requirements of the present Army Command Management System and the Engineer Command utilizing a revolving fund were analyzed in detail.

Presented in detail in Appendix C are the assumptions, methodology, and findings of an analysis of resources. The first part of the analysis identifies potential savings resulting from integration of the FE organizations located in the Norfolk, Virginia area and the Norfolk District field organization. From this case study analysis, estimates were made regarding potential CONUS-wide personnel reductions.

The analysis of the Norfolk, Virginia area considered the Army installation of Fort A. P. Hill, Fort Pickett, Fort Lee and Fort Eustis, as well as the Corps of Engineers' Norfolk district and field offices. As in Exhibit VIII-12, the Norfolk analysis identified potential personnel savings of 38 spaces.

As indicated in Exhibit VIII-13, the CONUS analysis considered 94 major Army installations and identified potential personnel reductions amounting to approximately 1,400 spaces. These space reductions result from improved use of engineering skills and support personnel.

Therefore, on the basis of evaluation of alternatives for management of the Army Real Property Activities, considering both system management criteria and resource requirements, the Engineer Command utilizing a revolving fund is the preferred alternative.

POTENTIAL NORFOLK AREA SAVINGS

	NET SAVINGS - FE	NET SAVINGS - BASOPS	NET SAVINGS
Ft. Eustis	10	5	15
Ft. Lee	9	4	13
Ft. A.P. Hill	3	2	5
Ft. Pickett	2	3	5
TOTAL	24	14	38

SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

EXHIBIT VIII-13

POTENTIAL CONUS SAVINGS

SAMPLE CASE	NET SAVINGS FE STAFF	NET SAVINGS BASOPS	TOTAL SAVINGS
FT. EUSTIS	10	5	15

(NO. OF MAJOR INSTALLATIONS) X 94

TOTAL SPACES SAVED - 1,410

SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

IX. RECOMMENDATIONS AND BENEFITS

IX. RECOMMENDATIONS AND BENEFITS

Objective appraisal of the strengths and weaknesses of the present management system for RPMA, as well as analyses of the relative merits of alternative organization concepts, indicate that greater integration of RPMA management and execution is needed. It is recommended that this integration be accomplished, in part, by alignment of the facilities engineering organization within the Corps of Engineers division/district structure. To ensure proper consideration of the needs of the installation commander, this organization should be established within the framework of a revolving fund for the provision of essential services.

It is recognized that a number of factors need to be considered as the Army decides upon the recommended course of action. Because of the important interrelationships of RPMA with these factors, and in order to ensure that analysis and recommendations of the study are understood and interpreted in the broader context, the following critical factors that must be considered in any proposed major realignment of RPMA management have been identified:

- Interrelationship of RPMA to Total Army Objectives -- Optimizing RPMA without adversely affecting Army objectives of troop deployment, mobilization, training, readiness, and quality of life support is not only difficult but most likely unwarranted. On the other hand, some compromise is required. It is necessary for RPMA, as a part of RPMS, to interact with total Army objectives to achieve long-term goals.

- Philosophy of ACMS -- The Army philosophy and tradition of management whereby maximum authority is decentralized to the installation commanders is in conflict with the identified optimum alternative. Undoubtedly, commanders may resist this concept as they have "stovepipes" which have been installed for management of installation commissaries, data processing, medical services, etc. All of these functions, once managed by commanders, have been removed from their control for many of the same reasons as those set forth relative to RPMA. The recommended concept bridges the gap between the commander's loss of control of RPMA in a "stovepipe" organization and the present decentralized system by utilization of a revolving fund concept whereby the responsibility for programming and budgeting of dollar resources, together with priority-setting, remains with the installation commander.

- Ongoing Changes In RPMA -- OCE headquarters realignments, current policy studies impacting RPMA, and actions taken on Phase I recommendations should be assessed after a "settling in" period, to determine what future changes are required and at what pace these changes can be implemented. Better operating systems for RPMA are necessary to improve management's ability to

make future decisions. Systems such as IFS may require modification to make them supportive of facilitities engineering needs.

- Difficulty in Undertaking Major Organizational Changes -- The Army's RPMS constitutes a complex and diverse system. Planning, executing, and controlling these activities in many parts of the world accordingly present significant management challenges. As a result of the complexity and the magnitude of change required to implement the recommended concept, realignment of management functions will require detailed planning and cautious implementation.

- Attitudes and Capabilities of CE -- The ultimate responsibility for executing RPMA will clearly rest with the Corps of Engineers. The facilities engineering function has traditionally not had the same status of professionalism as other Corps functions. Relationships between the FE staffs and the districts are sometimes less than satisfactory. Therefore, some division/district personnel may not feel the commitment needed for effective management and execution of RPMA.

  In addition, the management capabilities necessary to direct this challenging function in a responsive manner will need to be developed. Neither the Corps of Engineers nor any other DA organization currently has the capability to perform this important activity on an Army-wide basis without some management and organizational modifications.

The results of the evaluation of alternatives indicate that the best approach to the management of the Army's real property activities is to establish a revolving fund and assign RPMA performance responsiblity to the Corps of Engineers. This organizational change should be undertaken in a well-planned and orderly manner. Therefore, it is recommended that a five-year implementation strategy be adopted. This strategy should provide the Army with:

- The time necessary to improve operating systems so as to enhance support and provide management with meaningful data on which to base future decisions.

- A clear strategy for planning the orderly transition to the recommended structure.

- A means of testing the basic elements of the recommended concept, including the expanded role and responsibility of the Corps of Engineers in RPMA.

Organization Concept

The organization structure recommended for RPMA in the Army is an Engineering Command comprised of a consolidated facilities engineering organization and Corps of Engineers field offices reporting to the districts and divisions. As illustrated in Exhibit IX-1, there would be a dedicated FE work force at each installation. This group would be responsible for the performance of recurring maintenance activities.

Facilities Engineer

The installation FE is to provide services of a day-to-day nature, reporting to the appropriate district engineer and receiving technical support from district staff. The FE would become the installation's single point of contact for all new construction and real property acquisition. Normally, the FE would be appointed a contracting officer's representative by the district engineer.

The FE would be responsible to the district engineer for all construction, O&M, and real property activities taking place in his area of responsibility. He would receive support from the functional staff in the district as work load dictates. In addition the installation staff would include a limited complement of engineering and management personnel to perform design and management analysis required for recurring operations. Permanent engineering staff at the installation would be responsible for performing the following:

- Operation of utility plants.
- Maintenance of grounds, buildings, surface areas, and utility systems.
- Design and execution of minor construction and alteration projects within the design capability of the in-house staff.
- Execution of specific repair and maintenance projects within the design capability of the in-house staff.
- Inspection of contracted services awarded through local procurement for services such as custodial, refuse collection, etc.
- Execution of the installation's energy conservation program.
- Identification of installation requirements for repair, maintenance, operations, and minor and new construction.
- Identification of excess real property.

PROPOSED ORGANIZATION STRUCTURE

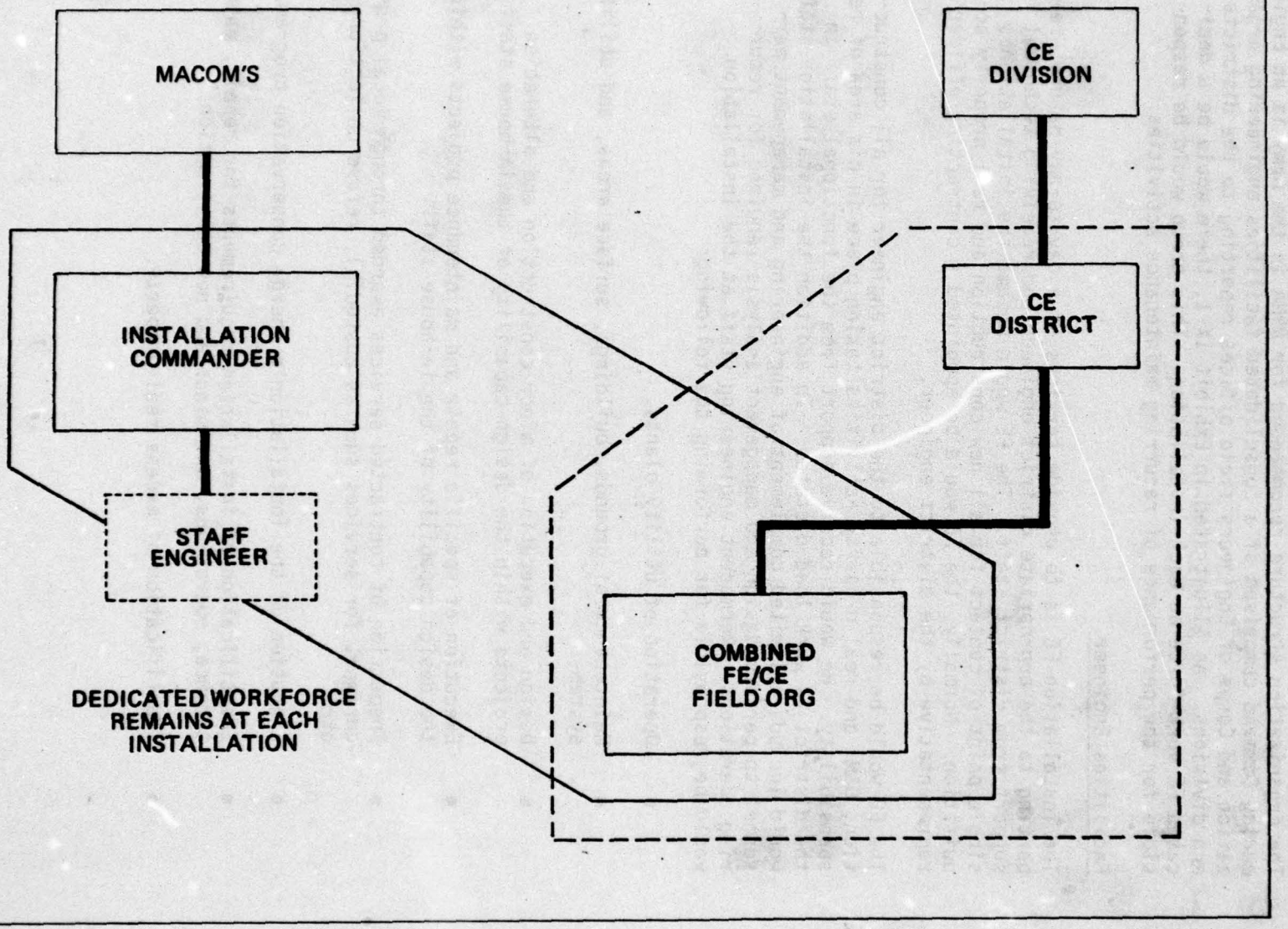


EXHIBIT IX-1

- Design reviews for new construction.
- Installation acceptance of new and rehabilitated facilities.
- Maintenance and repair of housing units.
- Coordination and supervision of active and reserve units performing RPMA projects.

CE Districts

Initially only the districts and divisions that presently perform military construction missions would become totally responsible for RPMS execution activities at the installation level. Over time, all districts should be brought into the RPMS management and execution process. Districts are to have a deputy for military programs to coordinate RPMS activities.

The bulk of the design and analysis would be accomplished in the district office. As a result, excess engineering and management personnel from the existing FE organizations would be integrated into the functional staff of the district or eliminated.

Funds for the design and execution of major repair/maintenance and minor construction projects by the district would be provided by the MACOM directly to the district, once the project had been approved and funded at the MACOM level.

The districts are to be totally responsible for RPMA, including: justification of projects in the preproject stage, development of functional and cost-effective designs, and use of life cycle costing to minimize total fixed and recurring costs in major repair or new construction projects.

Division Engineer

The division engineer would normally be provided with two deputies - one for military programs to oversee military construction and RPMA, and one for civil works programs.

OCE

The role of OCE in the recommended structure includes these additional functions:

- Management of the entire RPMA program through its divisions/districts.

- Allocation of all personnel resources.
- Technical review of special RPMA projects.
- Technical review of RPMA services performed by districts for installations.

Staff Engineer

In a few instances (e.g., exceptionally large installations), it may be necessary for the installation commander to retain a staff engineer to serve as a professional adviser to the commander and his staff. Functional responsibilities of the staff engineer are detailed below:

- Serving as staff adviser to the installation commander.
- Assisting the commander with planning, programming, and budgeting for all RPMA, including that for bachelor housing, which is presently done by the FE.
- Setting priorities for major work orders and requests.
- Acceptance of finished work.
- Liaison with the FE.

Management Process

The recommended concept considers the philosophy of the Army Command Management System by leaving responsibility for identification of requirements, programming, and budgeting under the authority of the installation commander. Execution is entirely the responsibility of the Corps. It accomplishes this through the establishment and operation of a revolving fund. The revolving fund allows the FE to perform RPMA services for the installation under contract to the installation or, under order of the installation, to compute the cost of performance, and to bill the installation accordingly. As bills are paid, the FE's revolving fund is reimbursed for these services. In effect, it enables the installation commander to determine what shall be done and when, but leaves performance to be managed by engineers skilled in the techniques of operations and maintenance. The management process is illustrated in Exhibit IX-2.

Revolving Fund Characteristics

Revolving funds or working capital funds have been in use for over 30 years. Separate funds have been established for each of the military services. These funds are generally referred to as industrial funds within DOD. Under this concept, activities using revolving funds are provided with initial working capital to finance the cost of producing

goods or services. Subsequently, the activity bills its customers for the services performed and is reimbursed by the customers from their various appropriations sources. Exhibit IX-3 illustrates this process.

Costs passed on to the customer normally consist of general operating expenses and overhead, including civilian salaries, supplies, travel costs, utility costs, and maintenance costs.

Various types of activities are currently financed by DOD industrial or revolving funds; these include shipyards, arsenals, depots, public works services, publication and printing services, communications, clothing manufacturing, and various transportation services. In addition, the Corps of Engineers has, since 1954, successfully operated a revolving fund which is tailored to water resource development and operations.

There are also a number of revolving funds in other Federal agencies. These funds are used for a variety of purposes, ranging from loan management to operation of a manufacturing plant. Some of the funds are described below:

- Department of Housing and Urban Development - revolving fund established in 1955 and capitalized at $175,000,000 for payment of costs incurred in Section 236 housing projects.
- Department of Transportation - aviation war risk insurance revolving fund established in 1958.
- Veterans Administration - loan guarantee revolving fund capitalized at $1.3 billion.
- Veterans Administration - direct loan revolving fund capitalized at $1.6 billion.
- General Services Administration - William Langer Jewel bearing plant revolving fund, established in 1970.

Basic advantages of using revolving funds include the following:

- Attention is focused on costs, resulting in more disciplined budgeting and financial control.
- Customers consider cost in developing requirements.
- The incentives and flexibility which are provided make activities with such funds more efficient and productive.
- A higher degree of cost-consciousness among managers, employees, and customers is promoted.

PROPOSED MANAGEMENT PROCESS

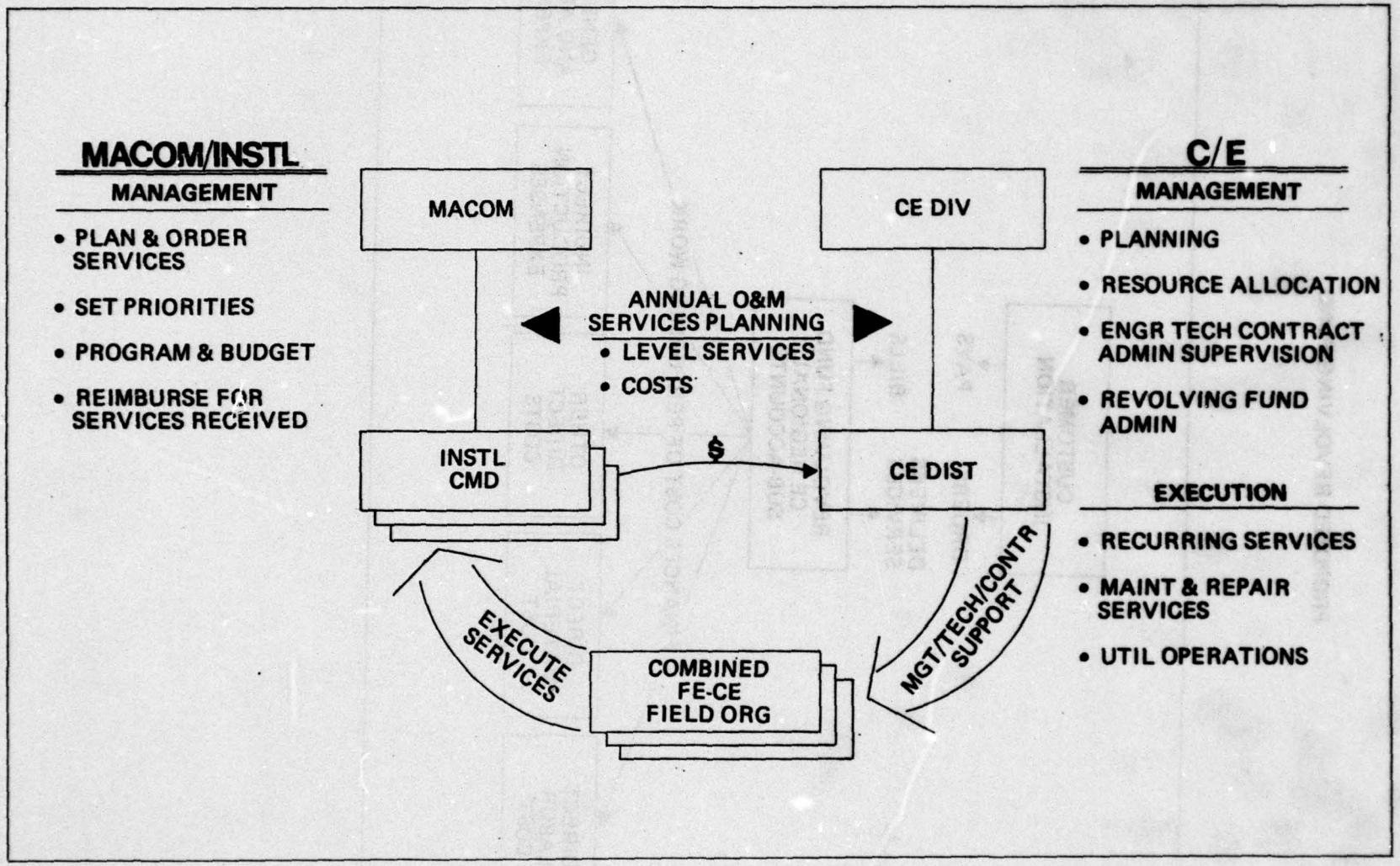
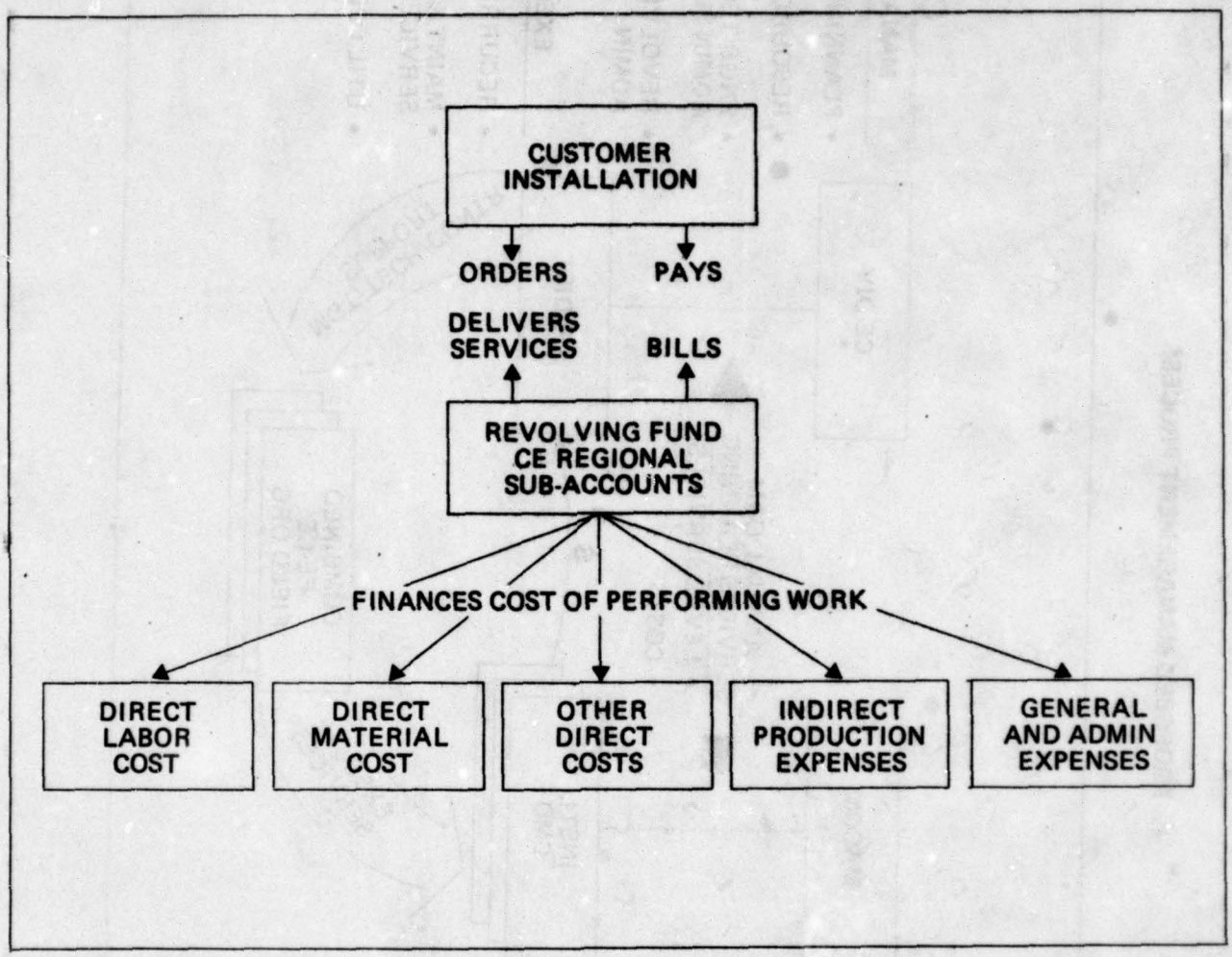


EXHIBIT IX-2

PROPOSED REVOLVING FUND



- The customer retains control over the level of service desired, as well as the priorities.

The buyer-seller relationship imposed by revolving funding encourages improvement of efficiency. Since customers receive bills for services provided, they are forced to consider costs in establishing their requirements. In most cases, customers do not have the option of procuring services elsewhere, but they can compare prices with other installations and outside sources. This can lead to pressures on the seller to be more productive.

The benefits of a buyer-seller relationship have not been completely documented, but DOD officials have indicated that there is ample evidence that customers tend to examine their requirements from an economic viewpoint more carefully under revolving funding. The Navy has reportedly experienced approximately a 10% reduction in total discretionary requirements after revolving funds were established for RPMA.

Managers of organizations with revolving funds can evaluate efficiency and personnel performance through their cost accounting system. Elements of overhead can be more easily identified and controlled than in direct-funded organizations.

Although patterned after systems used in the private sector, revolving fund activities are subject to the same personnel constraints as other defense agencies. Thus, the ability of managers to adjust their staff levels to work load requirements is limited by statutory regulations.

DOD has proposed that activities with revolving funds be permitted to use financial controls for managing staff levels. This concept has been tested at a few activities with mixed results, although GAO concuded that positive benefits were realized. However, Congress is reluctant to lift personnel restrictions from such organizations, since it believes that these ceilings are an effective method of control on defense spending.

An aspect of revolving funding of activities which has historically caused problems is the establishment of rates for performance of services. Where frequent price adjustments become necessary because of unforeseen changes in work, inflation, or material costs, the provision of services becomes a cost-reimbursable contract, resulting in elimination of incentives to control costs. Presently, efforts are being made to keep rates stable throughout the budget year by means of implementing a rate stabilization program.

Mechanics of an RPMA Revolving Fund

The RPMA revolving fund is to be capitalized separately and managed and controlled by OCE with sub-accounts administered by CE districts in support of CONUS Army installations. Each facilities engineering

organization at an installation would utilize a revolving fund and report to its appropriate CE district for technical and administrative control.

The Corps of Engineers currently uses a revolving fund accounting system approved by GAO for its water resource development and operation program. It may be feasible to utilize this system as the vehicle for RPMA funding.

The RPMA revolving fund is to apply only to the delivery of services to the installation. These consist primarily of recurring services and the maintenance and repairs required to maintain base-essential operations. Major repairs, alterations, and minor construction projects would not necessarily be processed through the fund, but would be executed by the district engineer and reimbursed by the MACOM. The costs for recurring RPMA services are to be billed to the customers, including the installation commander and installation tenants, on a routine basis. Payments for services rendered by the post facilities engineering organization are to be made by customers into the revolving RPMA fund.

It is anticipated that much of the accounting and billing required by the use of revolving funds can be centralized at the district level.

Characteristics of the revolving fund should include the following:

- Individual FE organizations should establish billing rate structures for services performed, using direct labor and material costs and applied overhead rates per cost center as the basis. The rates are to be approved at district level and reviewed at division level.

- Installation FE organizations are to use engineering performance standards to establish rates, where applicable.

- A rate stabilization program is to be utilized.

- District management is to require productivity reports from each facilities engineering activity in its jurisdiction and resolve any rate or performance discrepancies.

- All personnel resources in RPMA activities using revolving funds are to be controlled by OCE in compliance with the Army personnel system.

- District management is to have authority, upon approval from OCE, to transfer personnel between facilities engineering organizations within their district so as to balance personnel and skills with work loads or to adjust personnel levels up or down when work loads so dictate.

- Facilities engineers should be assigned a core of permanent employees and utilize temporary workers where feasible to accommodate seasonal and peak work loads.

- The facilities engineering supply function should operate as at present, except that all supplies ordered by the FE are to be reimbursed to the supply system by the RPMA fund and subsequently charged back to customers.

- Costs for military salaries are not to be included in customer charges, initially.

- Billing, accounting, financial controls, and reporting are to be centralized as much as possible at the district level.

- The FE, in liaison with the installation staff engineer, is to be responsible for identification of funding requirements needed to support base RPMA requirements. The FE should advise all customers of RPMA costs for inclusion into their respective budgets, otherwise they will have difficulty in estimating and programming costs.

- RPMA involving family housing can be performed as at present, with payments processed through the revolving fund.

To implement the RPMA revolving funding concept, an initial capitalization requirement equivalent to 3 or 4 months of the total annual recurring RPMA budget may be required. The total increase in staff required to administer and manage the RPMA revolving fund is not expected to be sizable, since much of the budgeting and cost accounting activity is already in existence. With increased use of data processing equipment and centralization of accounting functions, the net overall increase in staff should be more than offset by the advantages gained through having a more cost-sensitive and controllable RPMA program.

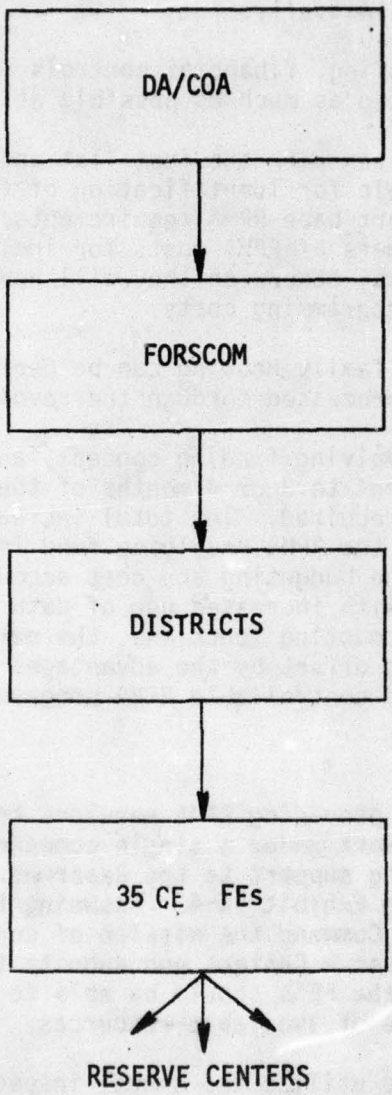
Reserve Centers

The 35 installation FE's providing RPMA services to the Reserve Centers would be performing the work under a single command. This realignment should assist in providing support to the Reserves. Flow of funding for OMAR would be as shown in Exhibit IX-4. Assuming the Army assigns the 416th U.S. Army Engineer Command the mission of conducting annual condition surveys of all Reserve Centers and submits their efforts to the corresponding district, the FE's should be able to schedule their work loads to make maximum use of available resources.

The FE's would be able to utilize the annual inspection efforts to prepare annual and long-range maintenance and repair plans and programs for each center. The budgets and programs would be prepared by the FE's, reviewed by the districts, and forwarded to FORSCOM for assembly into the OMAR annual program. These condition surveys would become the corner-

Exhibit IX-4

FLOW OF OMAR FUNDS TO RESERVE CENTERS



stone of a sounder budget, program, and allocation process for RPMA at the various Reserve Centers. These changes, along with those contained in the Phase I report, should enhance RPMS support to the Reserves.

Benefits

Implementation of the recommended management structure and process for RPMA would provide the Army with a number of significant benefits. These benefits include the following:

- Concentrated management of the facilities assets of the Army through an integrated functional command would be achieved. RPMS becomes a fully integrated system under the direction of the Chief of Engineers.

- More cost-consciousness would be attained by utilizing a revolving fund concept. Under the present system, data are not available to determine total system costs; under the proposed concept, total costs will be available.

- The full advantage of existing CE geographic offices can be attained. A "new" regional organization is not required. A field organization which performs two of the five RPMS functions already exists. Most major active military installations currently have Corps of Engineers resident, project, or area offices.

- The proposed concept is more responsive to the changing needs of the Army. The ability to contract for services on a national or regional basis, either single-function or multi-function, would be enhanced.

- The existing technical capability of the Corps of Engineers can be utilized in O&M. The Corps districts have design, contracting, and construction management capabilities, which are the principal technical deficiencies in the facilities engineer organization.

- Evaluation of FE performance by the Corps Engineer Command will tend to produce a career-oriented facilities engineering promotion ladder. The facilities engineers will become members of the engineer family and be provided with career paths from installation to district, division, and OCE. In addition, the Corps civilian personnel grade structure is generally higher than its FE counterpart.

In addition to the overall benefits of improved system management resulting from implementation of the recommended concept, there are opportunities for significant savings in resource requirements. Quantification of the savings resulting from consolidation of personnel resources, im-

proved cost identification, improved technical direction, and integration of the total RPMS are identified and described below:

- Consolidation of personnel resources - analyses indicate that implementation of the recommended structure can be expected to result in savings of approximately 1,406 personnel spaces CONUS-wide. This reduction is due to improved utilization of engineering and support personnel resulting from consolidation of FE organizations with Corps district and field offices. These space savings are comprised of 888 spaces from engineering functions valued at approximately $17,760,000, as well as 518 support spaces valued at $9,324,000. The detailed analysis of these savings is contained in Appendix C.

- Improved cost identification - Navy headquarters staff have indicated that establishment of revolving funds in public works centers has resulted in a reduction of approximately 10% in discretionary requirements. Under the recommended revolving fund, with an average CONUS FE budget of approximately $10 million and assuming that 20% of the budget is discretionary in nature, savings of $200,000 per installation or $18,800,000 CONUS-wide could be expected.

- Improved technical direction - the improved technical direction for O&M and RPMA will impact the very important area of contracting. The expanded contracting capability of the consolidated organization should provide more effective contract administration and, more importantly, expanded opportunities for regional, area, and national contracting. The average installation has contracts amounting to approximately $7,500,000 (excluding utilities contracting). Assuming a 5% to 10% reduction in contract costs due to improved contracting, there is potential for from $125,000 to $250,000 per installation or $11,750,000 to $23,500,000 CONUS-wide.

- Integration of RPMS - probably the most important benefit, but also the most difficult to quantify, is the potential for savings due to true life cycle management. The O&M costs over a 40-year life normally exceed construction cost by a multiple of 4.5. Therefore, with an annual military construction budget of $700 million, the average annual projected O&M costs would be $78,750,000. If through better life cycle management O&M costs can be reduced by only 5%, there is the potential for savings of $3,938,000 annually. This estimate is very conservative, in that the true O&M costs in the later years of a building's life would be significantly greater.

Therefore, implementation of the recommended concept would provide the Army with the potential for annual savings of approximately 1,406 personnel spaces and $61,572,000 - $73,322,000. The potential savings are summarized in Exhibit IX-5.

SUMMARY OF ESTIMATED COST BENEFITS
(BASED ON 94 MAJOR CONUS INSTALLATIONS)

	SPACES	DOLLARS
• CONSOLIDATION OF PERSONNEL RESOURCES		
- Reduction in Engineering Spaces	888(1)	$17,760,000
- Reduction in Support Spaces	518(2)	$ 9,324,000
• IMPROVED COST IDENTIFICATION		
- 10% Reduction in "Discretionary" Requirements		$18,800,000
• IMPROVED TECHNICAL		
- 5% - 10% Reduction in Contracting Costs		$11,750,000 - $23,500,000
• INTEGRATION OF RPMS		
- 5% Reduction in Life Cycle Costs		$ 3,938,000
TOTAL ESTIMATED SAVINGS	1406	$61,572,000 - $73,322,000

NOTES: (1) Valued at $20,000 each

(2) Valued at $18,000 each

SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

Additional Recommendations

During the performance of this study, additional recommendations for system improvement that are intended to enhance RPMA management, regardless of major organizational changes, were developed by the study team. Some of these recommendations apply to all MACOM's; others relate specifically to DARCOM and are so identified. Also included in this section are those recommendations made in the Phase I report that are compatible with the findings and recommendations of this study. These additional recommendations are set forth below:

- Review the design of the Integrated Facility System to ensure that it adequately meets the management needs of the RPMS. This review should be directed toward simplification of report generation, reduction of data requirements, and improvement of its compatibility with other information systems.

- Redefine RPMA to include all programs for maintenance and operation of Army real property, specifically such programs as: 722896, 728011, OSHA, RDT & E, FH, PAA, and BMAR.

- Streamline existing contracting procedures:

  . Develop specific DA guidelines as to which functions are to be contracted.

  . Develop detailed specifications for contract functions.

  . Consolidate specification writing at districts or lead installations, to reduce administrative work loads.

  . Evaluate alternative methods of contracting for multiple functions at an installation or for single functions at several installations.

  . Develop service contracts that relate contractor profits to performance as in the case of GOCO plants.

- Designate the FE as the contracting officer's representative (COR).

- Develop a set of performance evaluation factors for consistent use by all MACOM's.

- Remove restrictive regulatory and statutory provisions.

  . Reduce engineering technical reporting.

- Relax constraints on minor construction.
- Reduce restrictions on combining appropriated and non-appropriated funds on construction projects.

- Assign the 416th Engineer Command responsibility for facility condition inspections to Army Reserve Centers and inactive Army installations, where feasible.

- Remove the $500 limitation on incidental improvements to FH units. Redefine authority limits for FE to a higher level.

- Improve the Annual Work and Resource Management Plans, and consolidate the plans into one document in greatly summarized and shortened form (perhaps no more than 10 to 15 pages for each installation). The plan should show total requirements only, without regard to funding status. The planned work load should be separated into the portions expected to be performed by installation forces and by contract. Available or nonscheduled planned time for standing operation orders, service orders, and individual job orders should be shown. Planned contract items and supplies should also be identified separately.

DARCOM

Although DARCOM presently has a highly complex system for delivery of RPMA services through the Army Industrial Fund, numerous deficiencies in the present system exist, as outlined in Section VII. Because of the complexity of the existing system and the general lack of documentation of the functional mechanics of the system, there is a temptation to treat DARCOM as a special case, immune from the major organizational recommendations made for FORSCOM and TRADOC.

However, the major organizational recommendations presented in this report can be adapted to DARCOM. The recommended concept should be feasible in DARCOM, although implementation can be expected to take longer because of the interfaces required between the proposed RPMA system and the DARCOM integrated BASOPS management structure.

Consolidated RPMA management through the Corps of Engineers is recommended as a long-term objective for DARCOM. Other recommendations specific to DARCOM include:

- Aggressive action should be taken to consolidate DARCOM production, rebuild, and supply requirements in as few facilities as possible, to minimize O&M requirements for active facilities.

- Direct funding of remaining underutilized plant capacity is recommended (after capacity consolidations have taken place) to preserve Army assets.

- To achieve better personnel utilization, production equipment maintenance should be performed by the FE division at depots and arsenals where feasible.

OUTSIDE THE CONTINENTAL UNITED STATES (OCONUS)

The recommended concept described in this report applies only to those commands and installations in the Continental United States and Alaska. Review of the RPMA process in OCONUS indicated that realignment to an Engineer Command organization for RPMA is not warranted.

The following paragraphs briefly describe the rationale for recommending that the Engineer Command concept not be implemented for OCONUS.

United States Army, Japan (USARJ) - The United States Army in Japan was established in 1957 and became a subordinate command of the United States Army, Pacific in 1960. Under the provisions of the Status of Forces Agreement, the Government of Japan provides the land and facilities required by USARJ. During the past several years, the United States presence in Japan has been decreasing. The Corps of Engineers district personnel complement has been reduced to 86 (the smallest in the Corps), with work load also diminishing rapidly. Since the Corps district may be phased out in a few years, it is considered inadvisable to assign RPMA responsibility in Japan to the Corps of Engineers.

Eighth United States Army (EUSA) - In Korea, there is a Corps of Engineers district and a sizable military presence. However, the Army force level in Korea is decreasing and RPMA requirements should decrease correspondingly. Therefore, a reorganization now would be counterproductive.

United States Army, Europe (USAREUR) - USAREUR is moving toward implementation of a field Army deployed concept. Under this concept, base support is to be provided by contract, host nation support, or some combination of these. In addition, real property management responsibility is to be transferred to the Federal Republic of Germany. The United States Army Engineer Division, Europe (EUD) is an operating division without districts. EUD presently has a large work load amounting to approximately $410 million (FY 79).

For these reasons, it is not recommended that the FE organizations in Europe be realigned under the authority of the EUD. However, the review of the USAREUR real property management process identified two major problem areas that need to be addressed.

One problem area is the numerous organization levels of RPMA management, review, and technical activities. The subordinate command level engineering functions are equivalent to what would be a Major Subordinate Command level in either FORSCOM or TRADOC. In addition, the Deputy Chief of Staff, Engineer in USAREUR has established the Installation Support Activity, Europe (ISAE). ISAE is to be responsible for: establishing supply policy, representing the user when construction is performed by EUD, performing RPMA program evaluation, monitoring energy programs, and providing technical support to communities.

The brief review of USAREUR that was conducted in this study indicated that these numerous levels of organization are not warranted. It is recommended that the organization structure be examined in depth to ascertain an applicability to RPMA in Europe, especially in light of the trend toward increased contracting.

The second problem area is that of contract management. In a number of situations, the management of contracted functions has been less than adequate. For example, at Kaiserslautern where the maintenance of an Army facility is assigned to the Air Force, the contractor retained is not subject to adequate performance specifications. In addition, the arrangement is such that there may be cases where work orders are transmitted directly from the facility to the contractor (bypassing the Army and Air Force representatives).

As the Army expands its contracting under the field Army deployed concept, it is important to have in place the necessary mechanisms and personnel for contract management. Therefore, it is recommended that USAREUR establish a "model" community for which all work is contracted for the purpose of developing and testing the necessary management methods, techniques, and concepts.

X. IMPLEMENTATION STRATEGY

X. IMPLEMENTATION STRATEGY

Implementation of the recommendations presented in Section IX will require substantial planning to bring about an orderly transition from the present ACMS to the proposed organization structure. It is recommended that the implementation process include pilot programs involving FORSCOM, TRADOC, and DARCOM participation. These pilot programs are necessary to develop the detailed processes, procedures and structures of the proposed system. The total implementation time frame is estimated to be five years.

To ensure successful implementation of the recommended concept, development of various procedures, policies, methods, and standards is required. Specific items of importance include:

- Coordination with other changes in RPMA - Changes taking place in the areas of expanded contracting and greater CE support ("One-Stop") of RPMA services need to be coordinated with the implementation of the recommended system.

- Assessment of installation engineering expertise - A case-by-case analysis of the work load and corresponding engineering expertise at each installation is required to determine the extent that engineering personnel in Engineering and Services Branch, Management Engineering Systems Branch, and Master Planning Branch can be consolidated with appropriate Corps of Engineers districts and field offices.

- Alignment of district and field offices - To determine which Corps of Engineers districts are to be utilized in the support of RPMS to installations, existing district work loads and engineering capability in both civil works and military construction districts need to be analyzed. The geographical dispersion of field offices relative to the location of Army installations and reserve centers need to be reviewed.

  At district headquarters level, a facilities engineering office may be necessary to coordinate FE matters until the existing functional staffs become oriented to and familiar with FE requirements, constraints, and procedures. Two deputy district engineers would be required - one for civil works programs and one for military programs. At division level, two deputy division engineers would also be required - one for civil programs and one for military programs. However, division personnel would interface with counterparts within the OCE for RPMS matters.

- Modification of personnel system concept - The personnel system would require modification under the recommended organization. Currently, all personnel performing facili-

ties engineering functions are on the installation TDA's and are serviced by installation civilian personnel offices for grade evaluation, pay, hiring, administration, and grievances.

The recommended concept requires transfer of all installation FE personnel, both military and civilian, to the jurisdication of the Chief of Engineers. Therefore, these personnel would be placed on the district TDA's, be serviced by the district civilian personnel office, be paid centrally from the Corps central payroll center in Omaha, Nebraska, be integrated into the Corps of Engineers data bank for civilian personnel career fields, receive Corps training courses, and be managed by OCE Office of Personnel. Manpower allocations and surveys would be made by the divisions and reviewed by OCE. Exhibit X-1 presents a proposed personnel rating scheme for the recommended concept.

- Establishment of RPMA revolving fund - To establish a revolving fund, it is necessary to receive Congressional approval for the initial capitalization. The total capitalization is estimated at the value of 3 to 4 months of expenditures. Therefore, initial capitalization requirements must be estimated and justified.

- Development of billing rates - A procedure would need to be developed for determining rates to be billed to customers. Billing rates should be based on fixed unit rates as much as possible, to foster incentives for efficiency and overall cost control. A rate stablization program restricting frequent rate adjustments for RPMA services would need to be defined to ensure that customers' annual budgeting procedures for RPMA work would be meaningful and to provide an incentive for the FE organization to perform services at minimum cost.

- Development of financial administration and control procedures - Utilization of a revolving fund will require the development of financial procedures for cash management, including monitoring of accounts payable and receivable. Billing procedures, including billing format, frequency, and terms of payment, need to be developed. Centralization of revolving fund financial activities should be a basic objective. An analysis to determine which specific accounting functions are to be performed at the installation using existing staff will be required. Centralization of fund control at the district level is desirable, and these procedures, including reporting requirements, need to be identified and developed so that they will be compatible with DA regulations concerning regulation of revolving funds. Since the Corps of Engineers water resources program currently uses a revolving fund, this fund may be used as the vehicle for administration of the RPMA fund. At a minimum, the revolving fund experience of civil works should be drawn upon in the establishment of RPMA fund procedures.

Exhibit X-1

PROPOSED RATING SCHEME

Recommended Alternative	Rated	Indorsed	Reviewed
• FE (Non-DARCOM)	DE	Inst. Cmdr.	DCE
• FE (DARCOM)	Chief Support Serv.	C/S	Inst. Cmdr.
• FE (USAER)	Unknown		
• DE (MC)	Div. Engr.	DCE**	COE
• DE (CW)	Div. Engr.	DCE**	COE
• DE (MC & CW)	Div. Engr.	DCE**	COE
Current System			
• FE (Non-DARCOM) (Non-USAREUR)	Chief of Staff	Installation Cmdr.	MACOM
• FE (DARCOM)	Chief Support Serv.	C/S	nst. Cmdr.
• FE (USAREUR)	Unknown		
• DE (Mil. Constr.)	Div. Engr.	Dir. CW	DCE
• DE (CW)	Div. Engr.	Dir. CW	DCE
• DE (CW & MC)	Div. Engr.	DCE*	COE

NOTES: * Input from Directors MC & CW
** Input from Directors MC, CW & FE

- Identification of facilities engineering reporting requirements - Performance information will be required at the Corps of Engineers district and division levels to monitor individual FE organizations. It is expected that maximum use of IFS will be made to monitor installation work loads, personnel utilization, and other parameters to provide district engineering management with meaningful information for controlling RPMA. Development of new reports and revision of existing IFS reports and report distribution may be required.

- Development of contracting policies and guidelines - To facilitate efficiency of FE operations, OCE should issue policy guidelines concerning contracting for services. Procedures, guidelines, and detailed contract specifications identifying which services are applicable for contracting, and when contracting is warranted, should be developed. Procedures and specifications for contracting engineering-related services that afford FE's maximum flexibility also need to be defined.

- Development of FE subsystem support - The interface between the FE and the installation needs to be fully developed for services, including communications, supply, data processing, medical, procurement, etc.

Implementation Timetable

Exhibit X-2 presents a proposed five-year implementation schedule and identifies key milestones. The year milestones are those that must be completed prior to field implementation. These milestones are described below:

- DOD approval of concept - Prior to initiating any implementation action, it will be necessary to obtain DOD approval and commitment regarding the recommended concept.

- Congressional approval of capitalization - As stated earlier, Congressional approval of the capitalization for a new revolving fund is needed. However, depending upon the number of installations selected for the pilot programs and the amount of capitalization required, it may not be necessary to receive capitalization approval for the pilot programs.

- Identification of pilot program sites - It is anticipated that the pilot program sites will be selected so as to ensure involvement of FORSCOM, TRADOC and DARCOM and recognition of their unique operating environments.

- Establishment of implementation team - The required personnel resources and skills need to be identified and an implementation team established. At a minimum, the implementation team should include CE, TRADOC, FORSCOM, and DARCOM personnel. The team should also include a small administrative staff.

IMPLEMENTATION SCHEDULE AND KEY MILESTONES

MAJOR ACTIVITY	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
DOD APPROVAL OF CONCEPT	*					
CONGRESSIONAL APPROVAL OF CAPITALIZATION	*					
ESTABLISH IMPLEMENTATION TEAM	*					
IDENTIFY PILOT PROGRAM TEST SITES	*					
DEVELOP PILOT PROGRAM PROCEDURES	6 months					
CONDUCT PILOT PROGRAM		18-24 months				
ASSESS PERFORMANCE OF PILOT PROGRAMS, IF NECESSARY, MODIFY PROCEDURE		24-30 months				
PERFORM FULL-SCALE IMPLEMENTATION				24-30 months		

NOTE: * means activity must be completed prior to implementation

SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

Exhibit X-2

- Development of a pilot test program procedure - It is estimated that approximately 6 months will be necessary to activate the pilot program procedures. Data collection and reporting controls and procedures need to be established.

- Conduct of pilot programs - A minimum of 18 months and up to 24 months is recommended for the pilot programs. This time frame will allow for operation over the complete planning and budgeting cycle.

- Assessment of performance of pilot programs and, if necessary, modification of operating procedures - It is important that the pilot programs be objectively monitored to identify any problem areas. It is recommended that the pilot program monitoring include detailed assessment of system performance. This assessment would serve to ensure that all of the important operating areas have been fully considered. Exhibit X-3 contains a suggested list of factors to be measured and evaluated during pilot program operations.

- Full-scale implementation - Once pilot testing has been completed and all system components are determined to be functioning properly, full-scale implementation can proceed. It is estimated that complete implementation will require 2 years.

The proposed implementation schedule is subject to timely decision-making regarding all major approval requirements.

Exhibit X-3

Pilot Program Measurement Factors

1. Cost Before and After

   - Indirect costs in the installation, MACOM, division, and district.
   - Common support costs. (ADP, supply, transportation, P&C).
   - Direct cost (standard vs. actual).
   - Savings attributable to systems change.

2. System Responsiveness

   - Appraisal of customer satisfaction.
   - Responsiveness on IJO's, SO's, etc.

3. System Capacity

   - Ability of CE organization to assume responsibilities.
   - Ability to provide upgraded contracting capacity.

4. Requirements Analysis and Facilities Indices

   - Changes in customer requirements.
   - Facility condition before, after.

5. Management Analysis

   - Reporting and record-keeping requirements.
   - Timeliness of accounting and performance data.
   - Support of budget preparation and justification process.

APPENDICES

APPENDIX A

Installation Overhead

This appendix presents an analysis of installation overhead within the FE organization for two sizes of installations.

INSTALLATION OVERHEAD*

DA PAMPHLET 570-551 - STAFFING GUIDE FOR U.S. ARMY GARRISONS

FE DEPARTMENT/FUNCTION	LARGE SIZE FE ORGANIZATION		SMALL MEDIUM FE ORGANIZATION	
	Authorized Overhead Employees	Authorized Total Employees	Authorized Overhead Employees	Authorized Total Employees
Office of the Director/FE	6	6	5	5
Director of FE Administration	6	6	3	3
Office of Chief, Engineer Resources Management Division	3	3	2	2
Programming/Budget/Accts/Statistics	6	6	4	4
Work Reception/Scheduling	6	6	4	4
Estimating & Facility Inspection	1	11	0	1
Industrial Engineering Service & Technical Assistance	6	6	3	3
Real Property	4	4	1	1
Office of Chief, Engineering Plans, Services Division	2	2	2	2
Engineering Services	4	41	1	6
Construction Inspection	2	11	1	2
Master Plans and Programs	5	5	2	2
Office of Chief, Supply, Storage Division	2	2	1	1
Property Control	7	7	3	3
Storage	13	13	2	2
Office of Chief, B & G Division	3	3	2	2

*See footnote at end of Appendix.

INSTALLATION OVERHEAD*

DA PAMPHLET 570-551 - STAFFING GUIDE FOR U.S. ARMY GARRISONS

FE DEPARTMENT/FUNCTION	LARGE SIZE FE ORGANIZATION		SMALL MEDIUM FE ORGANIZATION	
	Authorized Overhead Employees	Authorized Total Employees	Authorized Overhead Employees	Authorized Total Employees
Carpentry and Masonry	4	49	0	4
Packing and Crating	0	2	0	2
Building Preventive Maintenance	1	11	1	11
Custodial Service	1	9	1	9
Metal Working	3	23	0	2
Painting	3	24	0	2
Office of Chief, Roads, Railroads Branch	1	1	1	1
Pavements Maintenance	1	18	1	18
Asphalt, Gravel, Quarry Operations	1	11	1	11
Railroad Maintenance	1	11	1	11
Engineer Organizational/Maintenance	2	22	0	2
Office of Chief, Land Management Branch	1	1	1	1
Improved Grounds Maintenance	2	24	1	12
Unimproved Grounds Maintenance	2	18	1	9
Forestry Services	2	10	1	5
Fish and Wildlife	1	5	1	5
Pest Control	1	8	1	8
Fire Prevention and Protection	12	36	4	13
Office of Chief, Utilities Division	3	3	2	2

*See footnote at end of Appendix.

INSTALLATION OVERHEAD*

DA PAMPHLET 570-551 - STAFFING GUIDE FOR U.S. ARMY GARRISONS

FE DEPARTMENT/FUNCTION	LARGE SIZE FE ORGANIZATION		SMALL MEDIUM FE ORGANIZATION	
	Authorized Overhead Employees	Authorized Total Employees	Authorized Overhead Employees	Authorized Total Employees
Office of Chief, Mechanical Branch	1	1	1	1
Refrigeration/Air Conditioning Maintenance	3	30	1	10
Boiler Plants	3	30	1	10
Heating Systems Maintenance/Operations	3	30	1	10
Plumbing and Steam Fitting	3	30	1	10
Fuel Shortage and Issue	3	27	1	9
Office of Chief, Electrical Branch	1	1	1	1
Exterior Electrical Systems Maintenance	2	18	1	9
Interior Electrical Systems Maintenance	2	24	1	12
Office of Chief, Sanitation Branch	1	1	1	1
Water Plant	2	12	1	6
Sewage Plant	1	8	0	3
Exterior Water Systems Maintenance	2	20	1	10
Exterior Sewer Systems Maintenance	2	13	0	3
Refuse Collection and Disposal	2	8	1	4
TOTAL	150	672	68	251
% OVERHEAD EMPLOYEES	22%		25%	

*See footnotes at end of Appendix.

OVERHEAD ANALYSIS

	LARGE FE ORGANIZATION		SMALL MEDIUM FE ORGANIZATION	
	Number of Employees	% of Total Overhead	Number of Employees	% of Total Overhead
General Supervisor	27	18%	18	25%
Engineer Resource Management Division	26	17%	14	21%
Engineering Plans and Services Division	13	9%	6	9%
Supply and Storage Division	22	15%	6	9%
Direct Shop Supervision	62	41%	24	35%
TOTAL	150	100%	68	100%

FOOTNOTES TO APPENDIX I

All supervisory and clerical employees except those involved in direct shop labor, engineering design and inspection are considered to be in overhead. Examples of overhead employees are DFAE office personnel, clerical and secretarial employees, engineer resource management personnel except for inspectors, and division and branch chiefs and shop foremen.

The small to medium sized FE organization (271 employees) shown was chosen to represent the smallest organization that would have at least one foreman in the shops indicated. For this hypothetical organization the following assumptions were also made.

1. Minimum staffing levels are assumed in departments where the manpower requirement is based on square feet of building space, dollar value of projects processed, installation strength, average number of line items, or annual man-hours spent on individual job orders, etc.

2. Additional supervisory positions are required in the proportions given in the staffing guidelines for each shop, i.e. one additional supervisory position for each 17 pavement maintenance workers or one additional supervisory position for each 10 Engineer Organizational Maintenance workers.

3. No separate Hospital Support Division is required.

The large sized FE organization (672 employees) was chosen to represent a large FE organization that has at least 250 employees each in the Buildings and Utilities Divisions. For this hypothetical organization, the following assumptions were also made.

1. The assigned and attached military population on post exceeds 1,000, thereby justifying an Engineer NCO position in the Office of the Director of Facilities Engineering.

2. At least 35,000 annual work authorization documents must be processed by the organization.

3. At least 450,000 man hours per year are spent on individual job orders at this installation.

4. The facility has nearly 20 million square feet of facilities which are supported by the facilities engineer,

APPENDIX B

Installation Contract

This appendix presents an example of an installation contract for RPMA services.

FOOTNOTES (Continued)

5. The facility engineer processes at least $12 million in projects annually.

6. The installation has an authorized strength of at least 20,000 personnel.

7. The supply division processes an average of 220,000 line items each month.

8. The major portion of the custodial services required for the installation are performed by contract.

9. Three fire companies are required to provide fire protection services to the installation.

10. Additional supervisory positions are required in the proportions given in the staffing guidelines for each 17 pavement maintenance workers or one additional suprvisory position for each 10 Engineer Organizational Maintenance workers.

11. No separate hospital support division is required.

DEPARTMENT OF THE ARMY
Headquarters United States Army Training and Doctrine Command
Fort Monroe, Virginia 23651

FORT BELVOIR, VIRGINIA

1 JUN 1977

INSTALLATION CONTRACT

B-2

The attached contract contains the primary workload to be accomplished and the resources to be provided during FY 77. It constitutes a firm agreement and understanding between the undersigned.

A report reflecting the actual status of the program will be submitted in accordance with Department of the Army Letter of Instructions for Status of OMA Financial Plan (RCS CSCAB-307) and TRADOC Regulation 11-4 (RCS ATRM-2).

Robert C. Hixon

ROBERT C. HIXON
Major General, GS
Chief of Staff
US Army Training and Doctrine
Command

L. A. JOHNSON
Major General, USA
Commanding
US Army Engineer Center and
Fort Belvoir

FY 77 CONTRACT
($ in Thousands)

FORT BELVOIR, VA — INSTALLATION/ACTIVITY

1 JUN 1977 — DATE SIGNED

	FY 76					FY 77				
		MIL	CIV				MIL	CIV		
1. Resources (See Annex A for Details)	$	AGG	ES	FTP	MY	$	AGG	ES	FTP	MY
a. OMA-Mgn (Dir Obl-DO)	9,890.9	1,288	396	392	461	10,161.4	1291	327	327	350
Base Ops (DO)	24,604.6	496	1,190	1,121	1,051	25,640.1	565	1121	1066	920
Total Direct	34,495.5	1,784	1,586	1,513	1,512	35,801.5	1856	1448	1393	1300
Funded Reimb (FR)	433.7		1	1	6	120.8		1	1	6
Auto Reimb (AR)	8,847.5				246	8,757.8				313
Total Obl Auth (TOA)	43,776.7	1,784	1,587	1,514	1,764	44,680.1	1856	1449	1394	1519
b. FHMA (TOA)	4,914.3		19	19	19	5,217.5		21	21	18
c. NAF	1,068.7					1,154.0				
d. Command Stock Fund	31,811.8					13,067.0				
e. RDTE (675706)						116.8				
f. RPA	-0-					32.0				

2. Non Pers Var Cost Factor ($)	Previous	Current	
Avg Res Load - Rct			
- Sch	490	359	
MMYS	379	292	(- .J, .K, .L)
Receptees			

FORT BELVOIR, VA — INSTALLATION/ACTIVITY

1 JUN 1977 — DATE SIGNED

4. Special Interest Items

	FY 76	FY 77
a. Funds Programed for (DO):		
NBC Defense Tng	27.0	6.0
KP Contracts	906.7	995.1
Flying Hr Program - Mission		
- Base Ops (.D6)		
Printing Program-(TQA); Direct	(1,011.1) 876.6	(832.0) 767.2
Environmental Pgm - $ 1/	42.0	44.1
(ES:FTP:MY:MIL ES)	(3:3:3:0)	(3:3:3:1)
ADP Target	486.3	~~744.8~~ 501.3
Travel Target	279.4	437.4 3/
TEC	-0-	118.5
MRPF 2/	5,012.1	5,052.7
EMAR 2/	1,022.4	1,178.0
Alcohol & Drug Abuse Program	46.9	63.5

1/ Fenced 2/ Floor 3/ Includes $65.0K For DSMC.

5. Major Programs/Projects Not Resourced by this Contract

PRIORITY	KEY ACCOUNT	ITEM		AMOUNT
1	815796.M	Engineer Equipment		$116.0
		Sewer Cleaner, Truck Mtd	(17.0)	
		Portable Steam Boiler	(75.0)	
		4 Lawn Mowers, Tractor-Towed	(6.0)	
		Vacuum Leaf Collector	(8.0)	
		Shredding Machine	(10.0)	
2	815796.L	Handball Courts - PR 97058-77		75.0
3	815796.L	Terrace and Roof (Bldg 20) - PR 97064-76		125.0
4	815796.L	Exterior Siding on Bldgs, Post Wide PR 90130-76		150.0
5	815796.M	Compactor, (Santiary Fill)		75.0
			Total	541.0

FORT BELVOIR, VA — INSTALLATION/ACTIVITY

1 JUN 1977 — DATE SIGNED

3. Workload

	FY 76	FY 77
a. MOY Supported	6,553	6,356
b. Pers Processed - Recp Station		
c. Flying Hours - Mission		
- Base Ops		

	FY 76 US	FY 76 Non-US	FY 76 TOTAL	FY 77 US	FY 77 Non-US	FY 77 TOTAL 1/
d. Avg Res Ld (Pgm)- DSMC	111		111			
(Fin)	103		103	119		119
(Pgm)- SCH TNG (USARS)	1,471	45	1,516			
(Fin)	1,452	35	1,487	1,634	41	1,675
(Pgm)						
(Fin)						

	FY 76	FY 77
e. Printing - Million Units	138.0	102.0

f. Training Development End Products

Product (Details--Annex B)	# Complted FY 76/TT	Total Due FY 77-79	Actual # to be Completed FY 77	Actual # to be Completed FY 78	Equivalent Work in Process FY 77	Equivalent Work in Process FY 78
SQTs		107		15	8.25	71.25
TEC Lessons	7	138	46	34	51.00	53.00
ARTEPs	1	3	2	1	.80	.50
Soldiers/Cdrs Manuals		105	13	89	20.00	88.00
How to Fight Manuals		2	2		1.00	
Training Circulars					20.00	21.00
Other Field Manuals/TMs					11.00	6.00
Job Books		4	4		16.00	26.00

g. ROTC

	FY 77	FY 77
Units	6	7
Senior	(2)	(2)
Junior	(4)	(5)

1/ TRADOC will fund the actual load if it exceeds the financed load.

ANNEX A - SUMMARY OF RESOURCES

FORT BELVOIR, VA
INSTALLATION/ACTIVITY

1 JUN 1977
DATE SIGNED

1. OMA		FY 76 PROGRAM SUMMARY FUNDING Direct	TOA	Mil AGG	Civilian ES	FTP	MY	FY 77 PROGRAM SUMMARY FUNDING Direct	FR	AR	TOA	Military OFF	WO	ENL	AGG	Civilian ES	FTP	MY
Total All Pgm		(24495.5	43776.7	1784	1587	1524	1764)	(35801.5	130.8	8757.8	44630.1	282	27	1547	1856	1449	1394	1519)
Total Pgm 2		(					)	(										)
Total Pgm 5 OMAR				3								2		1	3			
Total Pgm 7		(64.7	70.4		1	1	1)	(20.0	12.8		32.8					1	1	1)
728010	2d Dest Tr	64.7	64.7					20.0			20.0							
728012	Log Spt Actv		5.7		1	1	1		12.8		12.8					1	1	1
Total Pgm 8T		(3397.2	43211.5	1780	1571	1498	1749)	(35124.8	108.0	8757.8	43990.6	280	27	1545	1852	1432	1377	1502)
812711	Ret Tng																	
812726	Sr ROTC	11.9	11.9					18.9			18.9							
812782	Gen Skill Tng 3/	6084.4	6266.5	816	313	313	332	5762.7		170.5	5933.2	194	18	599	811	245	246	245
812783	Prof Ed 1/4/	1755.2	1755.2				51	1929.5			1929.5				5/	5/	5/	59
812786.1	Stu TDY	34.3	34.3					46.2			46.2							
812786.3	Tng Devices	525.4	618.4	17	32	28	30	636.1		14.6	780.7	1		10	20	32	25	30
812786.4	Audio-Vis	452.3	482.9	3	19	19	15	545.1		12.3	557.4			2	2	19	19	19
812786.5	Sch Trps	208.8	211.4	454				251.2		2.0	253.2	25	2	427	454			
812786.6	ATSC																	
815748.U4G	(.012 Lim)	.6	.6					1.3			1.3							
815798.																		
815798.9	Career Int 1/	191.2	191.2		17	17	16	223.9			223.9					18	18	16
819721	Jr ROTC	8.5	8.5					19.8			19.8							
815796.2	Base Ops	24804.6	33600.6	496	1190	1121	1307	25040.1	108.0	8558.4	34306.5	60	7	499	585	1121	1066	1135
.B	Supply Op	(1643.3	1675.7	5	112	110	115)	(2042.2		138.2	2180.4	2	2	66	72	129	125	122)
.C	Maint of Mat	(1743.8	1861.7	3	102	102	100)	(1740.9		123.6	1864.5	1		2	3	97	97	92)
.D	Transp	(1804.1	1764.5	29	88	68	91)	(1574.8		129.2	1704.0	1		27	28	75	75	78)
.E	Ldry/Dry Cl	(415.6	683.7		49	35	49)	(375.9	108.0	109.8	593.7					44	25	37)
.F	Army Ed Pgm	(1080.0	1177.7	41	10	10	12)	(1193.4		32.3	1225.7			37	37	6	4	2)
.G	Pers Spt	(1363.5	1356.6	171	89	61	69)	(1339.7		139.3	1419.0	24		147	191	64	57	80)
.H	Each Hsg Pur	(159.5	159.5				)	(160.1			160.1							)
.J	Util 1/	(2332.8	5371.9		26	26	30)	(3478.1		3710.4	7188.5					45	45	35)
.K	MRRP 2/	(4408.4	6431.3		135	175	170)	(4408.2		1840.5	6248.7					146	138	144)
.L	Min Constr 2/	(80.7	876.5				10)	(846.5		63.7	710.2							10)
.M	Oth Eng Spt	(2447.4	3420.8		130	127	123)	(2987.2		1180.1	4167.3					135	133	133)
.N	Admin	(4614.3	5744.3	242	351	344	341)	(4999.1		1039.9	6039.0	41	5	193	239	339	331	333)
.P	ADP	(576.0	625.0	5	33	30	29)	(598.4		51.0	649.4	1		4	5	31	30	28)
.Q	Comm (Issue)	(2011.0	2349.0		13	13	159)	(197.1		.4	197.5					12	12	13)
Total Pgm 87		(448.8	448.8	1	13	13	12)	(582.7			582.7			1	1	14	14	14)
871712	ROTC Adv																	
871714	Recp Sta																	
872785	Oth Ed Pgm	448.8	448.8	1	13	13	12	582.7			582.7			1	1	14	14	14
878716	Pers Spt																	
Total Pgm 9		44.8	74.0		2	2	2	74.0			74.0					2	2	2
951212	Civ Exec Dev	16.1	17.5					38.5			38.5							
951214	Pub Affairs	28.7	28.7		2	2	2	38.5			38.5					2	2	2

1/ Fenced.
2/ MRPF Floor.
3/ Engineer School
4/ Defense Systems Mgt College

5/ MY and $ only are provided by TRADOC. ES & FTP & MAGG are provided by DA.

FORT [illegible], GA
INSTALLATION/ACTIVITY

1 JUN [illegible]
DATE SIGNED

	FY 76 PROGRAM SUMMARY						FY 77 PROGRAM SUMMARY									
	FUNDING		Mil	Civilian			FUNDING			Military				Civilian		
	Direct	TOA	ASG	ES	FTP	MY	Direct	FR	TOA	Off	WO	Enl	ASG	ES	FTP	MY
2. Family Housing Mgt Acct (FHMA)	(4907.1	4914.3		19	19	19)	(5205.6	11.9	5217.5					21	21	18)
1910 - Operations	1837.6	1844.8		19	19	19	2114.4	11.9	2126.3					21	21	18
1920 - Mnt/Real Prop Fac	3069.5	3069.5					3091.2		3091.2							
No of Units - On Post			1655									1,655				
- Leased			-0-									-0-				
3. Non-Approp Funds (NAF)																
a. Morale Support Fund			1048.7									1,154.0				
TRADOC Funding			(318.2)									(203.1)				
Minor Rev Prod Activities			(750.5)									(950.9)				
b. Personnel Compensation			360.2									763.1				
c. Ratio of Approp to Non-Approp			42:25									56/44				
4. Command Stock Fund																
a. Program Sales			21811.8									13,067.0				
b. Program Obligation Auth			31752.1									13,067.0				
c. Obligation/Sales Ratio			99.8%									100%				

ANNEX B - TRAINING DEVELOPMENT END PRODUCTS AND TRAINING WORKLOAD

Fort Belvoir, VA
INSTALLATION/ACTIVITY

1 JUN 1977
DATE SIGNED

1. Training Developments

DELIVERY DATES BY QUARTER

	TOTAL DUE FY 77-79	1st Qtr FY 77 (Oct-Dec 76)	2d Qtr FY 77 (Jan-Mar 77)	3d Qtr FY 77 (Apr-Jun 77)	4th Qtr FY 77 (Jul-Sep 77)	TOTAL FY 77	1st Qtr FY 78 (Oct-Dec 77)	2d Qtr FY 78 (Jan-Mar 78)	3d Qtr FY 78 (Apr-Jun 78)	4th Qtr FY 78 (Jul-Sep 78)	TOTAL FY 78
SQTs	107						3	7	5		15
TECs # Kits	138	2	6	17	21	46	12	4		18	34
ARTEPS	3			1	1	2			1		1
SOLDIERS MANUALS/ CMAS MANUALS	105				13	13	4		66	19	89
HOW TO FIGHT MANUALS	2			1	1	2					
TRAINING CIRCULARS											
OTHER FLD MANUALS/ TECHNICAL MANUALS											
Job Books	4			2	2	4					

2. Training Workload

		FY 78		
		US	Non-US	TOTAL
Average Resident Load	(Programmed) - DSMC			
	(Financed)	1/		1/
	(Programmed) - Sch Trng (USAES)			
	(Financed)	1,489	59	1,548
	(Programmed) - School Training			
	(Financed)			

* SQT - Final Draft to USATSC
TEC - Kit Delivered to Reproduction Facility.
TNG LIT - Camera-ready Copy.

1/ FY 78 Loads For DSMC Not Available.

FORT BELVOIR FY 77 TRAINING DEVELOPMENT WORKLOAD

TD Item	Pub No	Title
Soldiers/Commanders Manuals		
(4th) (3)	FM 5 12B 1-4	SM Combat Engineer
	FM 5 12B	CM Combat Engineer
(3)	FM 5 12C 1-4	SM Bridge Specialist
	FM 5 12C	CM Bridge Specialist
(3)	FM 5 12E 1-4	SM Atomic Demolition, Munitions Spec
	FM 5 12E	CM Atomic Demolition, Munitions Spec
	FM 5 12Z	SM Combat Engr Sr Sgt
Tot (13)		
How To Fight Manuals		
(3d)	5-100	Engr Bn Ops
(4th)	90-7	Obstacle/Counter Obst & Denial Ops
ARTEP		
(3d)	5-35	Engineer Combat Bn Corp
(4th)	5-115	Engineer Combat Bn (Heavy)
Job Books		
(3D)	TC5-12B1/2	
	TC5-62B1/2	
(4th)	TC5-12C1/2	
	TC5-12E1/2	

APPENDIX C

RESOURCE ANALYSIS

Background

This appendix presents a review of current RPMA and CE resource levels and an analysis of the potential impact on personnel resources resulting from consolidation of FE and CE field organizations.

Limited quantitative data are available regarding FE work loads, personnel strengths, and installation support provided to the FE. Present information systems differ among Army Commands. Most Army regulations and reporting requirements are orientated toward FORSCOM and TRADOC installations. DARCOM has many variations in its management reporting systems because of unique production, research, and development missions. USAREUR and other overseas Army organizations have developed specific information systems to support their respective missions. As a result, determination of the personnel resources that would be required to support RPMA when FE and CE organizations are consolidated is based on development of a specific case study. The results of this case study are used to estimate the potential CONUS-wide impact of the recommended organization structure. The primary sources of information used in this analysis included:

- OCE FY 76 Facilities Engineering Annual Summary Of Operations.
- National capital region consolidation study.
- Consolidation study of RPMA at Fayetteville, North Carolina.
- Corps of Engineers Performance Analysis Management System (CEPAMS).
- Comptroller of the Army BASOPS data reports.
- Engineer form 3018 B and C.
- Engineer form 4265-R.
- Phase I study data.
- TDA's of selected installations and districts.
- Interviews with Corps of Engineers personnel.

The case study analysis focused on the Corps of Engineers Norfolk District and the installations within its military construction boundaries. In addition to Fort Eustis, Fort Lee and Fort Monroe, this area contains

three sub-installations and a GOCO plant. As further described in this appendix, consolidation of RPMA into the CE field organization provides opportunities for significant reductions in personnel spaces as the result of improved utilization of existing CE resources.

Installation RPMA Resources

Information regarding the dollar values of the J, K, L, and M accounts (4016 subaccounts) at each installation and major command is readily available. However, the value of support provided to the FE's through other BASOPS accounts is not reported as such. The FE does not have information regarding costs for data processing services, comptroller, CPO, transportation, M & S equipment, supply, maintenance, etc. Although the information is included in the overall BASOPS account, it is not identified in sufficient detail to determine the actual cost of RPMA services at an installation.

Chart C-1 provides a summary of the FY 78 OMA budget (based on Comptroller of the Army report dated 18 October 1977) and indicates the FE accounts as a part of the BASOPS for the major commands.

The facilities engineering J, K, L, and M accounts represent 44.04% ($1,139,375,000) of the BASOPS funding and when H&R accounts are included, it rises to 45.12% or $1,145,752,000. Considering the J, K, L, and M accounts only, it can be seen that the installation commander's budget flexibility is restricted, because the J account for utilities must be paid as costs are incurred, and the Congressionally established floor for the K and L accounts is 90% of the appropriation amount. It is only in the M account that funds compete with other BASOPS funds. Even there, the cost of salaries, training, temporary duty, essential custodial and garbage collection contracts, in-house supplies, etc. reduce funds flexibility of the installations commanders. Therefore, the J, K, L, and M accounts are generally fenced as shown below.

Account	Available Amt. FY 78 (millions)	Fenced (millions)		Otherwise Available to Installation Commander
J	$ 364.046		$ 364.046	$ 0
K	477.652	(90%)	429.887	47.765
L	36.937	(90%)	33.243	3.694
M	260.740	(75%)	195.555*	65.185
	$1,139.375		$1,022.731	$116.644
*Assumes 75% committed			89.76%	(11.24%)

Hence, only 11.2% of the total FE budget is available for reallocation considering fixed costs and budgetary constraints.

CHART C-1

SUMMARY OF FY 1978 OMA BUDGET

MAJOR COMMAND DIRECT OMA ACCOUNT	TOTAL AMOUNT ($000,000)	PERCENT
A - Audio-Visual Services	$ 9.402	.36%
B - Supply Operations	128.121	4.95
C - Maintenance of Materials	242.033	9.35
D - Transportation Services	166.083	6.42
E - Laundry & Dry Cleaning Services	25.859	1.00
F - Army Food Program	117.796	4.55
G - Personnel Support	175.981	6.80
H - Bachelor Housing Furnishings Support	21.355	.83
J - Operation of Utilities	364.046	14.07
K - Maintenance & Repair of Real Property	477.652	18.46
L - Minor Construction	36.937	1.43
M - Other Engineering Support	260.740	10.08
N - Administration	357.765	13.82
P - Data Processing Activities	66.590	2.57
O - Army Commissary Operations	131.040	5.06
R - Installation Restoration	6.397	.25
	$2,587.797	100.0%

The comptroller of FORSCOM reported to the study team that 59% of FORSCOM's budget was required to pay the salaries of the civilian personnel at their installations and that their installation commanders had flexibility in determining or allocating 12% of the funds allotted to them. The table above validates the FORSCOM information regarding the limited flexibility of funds allocation at the installation level.

Available data regarding the personnel strengths of the installation FE organization are incomplete. The data collected in the Phase I study were summarized at the MACOM level. Since not all installations responded to the Phase I questionnaires, it has been necessary to extrapolate summarized data to determine the FE personnel complement of a typical installation.

In reviewing FE personnel complements, it is interesting to note that while there are 48,472 civilians in the RPMA work force, only 27,188 are in CONUS (includes Alaska and Panama Canal). The RPMA work force located overseas is primarily comprised of non-U.S. citizens.

A summary of facilities engineering personnel assigned to CONUS and overseas as of 30 June 1976 is shown in Chart C-2.

The actual work force of CONUS FE organizations varies from around 50 to over 900. The total FE work force in CONUS was 28,200 (not including those in major commands, inactive and subordinate installations, and OCE). Therefore, on the basis of 94 major active installations, the average FE work force is about 300. The breakdown of the typical FE organization is as follows:

Function	No. of Personnel
Office of Director	3
Director of FE Administration	4
Engineer, Resource Management	19
Engineer, Plans and Services	15
Supply and Storage Division	13
Buildings and Grounds Division	92
Utilities Division	122
Fire Protection Division	32
	300

Of these, approximately 86 (28%) are white collar employees and the remainder 214 (72%) are blue collar personnel.

The FE receives support service from the Management Information Systems Office (MISO), Adjutant General (AG), Comptroller, Civilian Personnel Office (CPO), Supply Division, Procurement, Transportation, Movements, Material Maintenance and Communications, etc. Data col-

PERSONNEL

FACILITIES ENGINEERING PERSONNEL ASSIGNED
CONUS AND OVERSEAS AS OF 30 JUNE 1976

COMMAND	TOTAL AT ACTIVE INSTALLATIONS		ACTIVE INSTALLATIONS				TOTAL AT INACTIVE INSTALLATIONS	
	CIVILIAN	MILITARY	OFFICERS	ENLISTED	U.S. CIVILIANS	OTHER CIVILIANS	CIVILIANS	MILITARY
CONUS								
FORCES COMMAND	9,525	150	75	75	8,635	890	42	8
TRAINING AND DOCTRINE COMD	7,427	94	47	47	6,983	444	1	
ARMY COMMUNICATIONS COMD	515	6	3	3	515			
DEVMNT & READINESS COMD								
AIF	5,436	14	7	7	5,436		11	
GOCO	2,031	12	6	6	2,031		66	
OMA	732	8	4	4	732		32	1
ROTE	675	4	2	2	675			
TOTAL	8,874	38	19	19	8,874		109	2
ARMY SECURITY AGENCY	178				178			
HEALTH SERVICES COMMAND	581	12	6	6	581			
MILITARY DIST OF WASH	457	6	3	3	457			
MILITARY TRAFFIC MGMT	300				300		18	
OFFICE, CHIEF OF ENGINEERS	27				27			
U S MILITARY ACADEMY	638	14	7	7	638			
TOTAL CONUS	28,522	320	160	160	27,188	1,334	170	10
OVERSEAS								
ARMY SECURITY AGENCY	168	2	1	1	5	163		
EUROPE								
GERMANY	13,531	122	61	61	179	13,352		
SETAF	217	4	2	2	3	214		
NATO SHAPE	104	4	2	2	3	101		
USAEMMIC	30	2	1	1		30		
TOTAL	13,882	132	66	66	185	13,697		
JAPAN	1,780	4	2	2	158	1,622		
BALLISTIC MSL DEF COMD								
KOREA	4,120	22	11	11	135	3,985		
TOTAL OVERSEAS	19,950	160	80	80	483	19,467		
ARMY-WIDE TOTAL	48,472	480	240	240	27,671	20,801	170	10

SOURCE: Page ZG, DA OCE FY 1976 Facilities Engineering Annual Summary of Operations

lected in previous consolidation studies have indicated that an FE organization that has a personnel complement of 300 receives approximately 25 to 26 man-years of support from other BASOPS activities. These support man-years are comprised of fractions of man-years, and further calculations of these consolidation studies indicate that the total man-years of support translate to approximately 17 to 18 identifiable (or transferrable) personnel spaces.

CE Field Organization Resources

The CE field organization within CONUS and Alaska includes 36 districts and the New England Division, which have geographical areas of responsibility for water resource development and operations. Eleven of the districts have both military and civil works responsibilities (Chart C-3). The CE field organization in CONUS also includes 11 divisions. Nine of these divisions have two or more districts under their jurisdiction. Resident and special project offices are located throughout the districts, and are either on or near Army installations.

The Huntsville Division is a functional operating division assigned specialized projects but without an assigned geographical area of responsibility. The New England Division is an operating division without districts and is largely responsible for water resources development in Massachusetts, Connecticut, Rhode Island, Maine, New Hampshire, and Vermont.

Projections of current and projected work load of the Corps of Engineers are presented in Chart C-4. A closer examination by program illustrates the magnitude of the current program by type of work, as shown in Chart C-5. The program as planned and executed by the field is shown in Chart C-6.

The Chief of Engineers has 38,124 civilian personnel and over 400 active military personnel in his divisions and districts performing civil, military, and postal construction. A breakout by office function of the engineer division headquarters for those divisions with assigned districts is shown in Chart C-7.

Similarly, Chart C-8 provides a breakout by office function for operating divisions without districts and for the districts for the divisions included in Chart C-7.

Not included in the two preceding charts are the personnel assigned to five Corps of Engineers research laboratories and the three field operating agencies, including ESG and FESA.

The engineering skills available within the CE field organization include industrial, civil, mechanical, architectural, and environmental engineering expertise. Also included in the CE organization are the full range of support services such as administrative, data processing, and financial.

MILITARY CONSTRUCTION DIVISION
DISTRICT BOUNDARIES

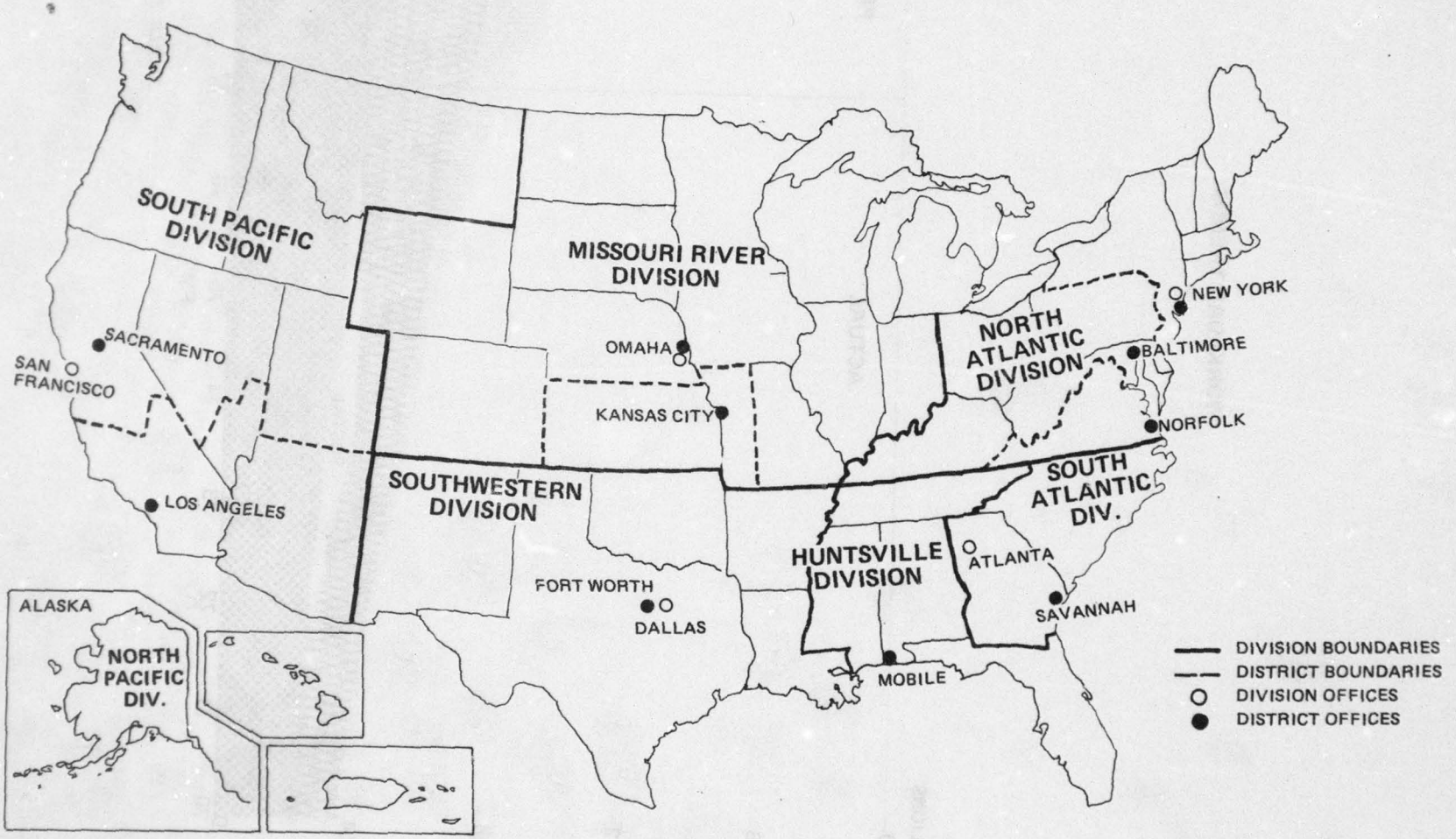
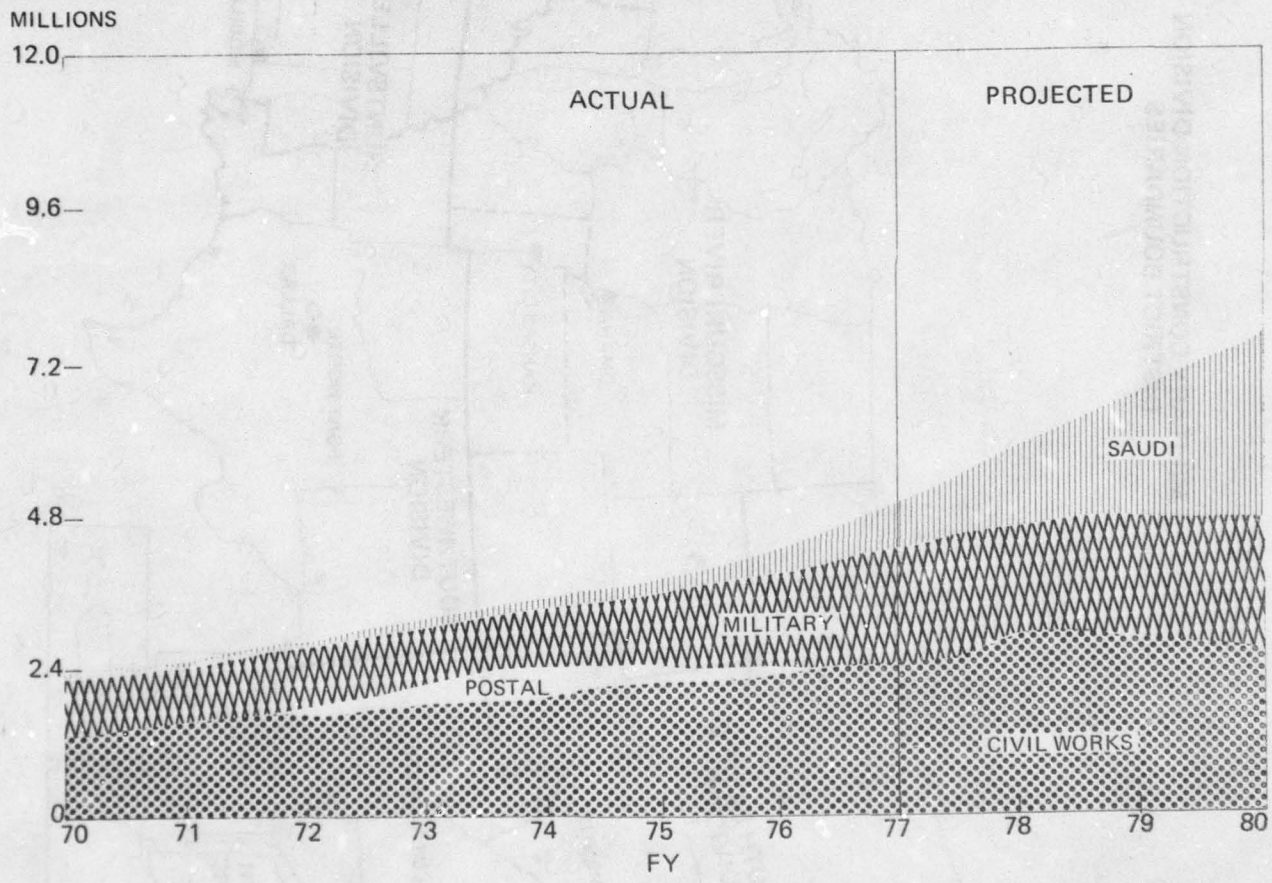


CHART C-3

CHART C-4

WORKLOAD TRENDS



SOURCE: FY 70-79: ENG FORMS 3018 b&c

TOTAL PROGRAMS - TRENDS

$ Millions

	FY76		FY77		FY78		%CHG	FY79		%CHG
	%	$	%	$	%	$	$\frac{6-4}{4}\times 100$	%	$	$\frac{9-6}{6}\times 100$
	1	2	3	4	5	6	7	8	9	10
GRAND TOTAL ALL PROGRAMS*	-	4,218.2	-	5,077.1	-	5,985.8	+ 17.9	-	6,890.3	+ 15.1
TOTAL - MILITARY	44.8	1,890.8	49.1	2,492.2	49.2	2,942.5	+ 18.1	58.5	4,026.9	+ 36.9
MCA	14.9	630.1	11.9	605.2	9.3	556.2	- 8.1	11.2	772.7	+ 38.9
PBS	2.0	87.4	1.4	69.0	1.1	68.4	- 0.9	1.6	107.3	+ 56.9
Housing	2.9	123.6	1.9	94.1	1.3	75.2	- 20.0	1.0	69.9	- 7.0
Air Force	6.8	286.8	4.8	246.6	6.4	382.2	+ 55.0	7.2	493.8	+ 29.2
Saudi Arabia	6.2	261.7	18.8	954.7	22.7	1,358.5	+ 42.2	30.7	2,112.0	+ 55.5
Other Military	11.9	501.2	10.3	522.6	8.4	502.3	- 3.9	6.8	471.2	- 6.2
TOTAL - CIVIL WORKS	53.7	2,266.4	50.4	2,559.7	50.5	3,024.7	+ 18.2	41.4	2,853.4	- 5.7
Construction, General	32.0	1,350.6	28.1	1,429.4	28.6	1,708.0	+ 19.5	24.8	1,708.9	+ 0.1
O&M	13.4	565.6	13.5	683.4	13.1	784.6	+ 14.8	11.1	762.6	- 2.8
General Investigation	1.5	64.7	1.3	69.0	1.7	103.9	+ 50.6	1.4	100.0	- 3.8
Flood Control & Coast Emerg	1.4	57.1	0.3	13.4	0.5	31.2	+132.8	0.1	8.9	- 71.5
General Expense	1.0	42.3	1.0	49.1	1.0	59.2	+ 20.6	1.0	68.9	+ 16.4
Miscellaneous	4.4	186.1	6.2	315.4	5.6	337.8	+ 7.1	3.0	204.1	- 39.6
TOTAL - POSTAL	1.4	61.0	0.5	25.2	0.3	18.6	- 26.2	0.1	10.0	- 46.2

*Excludes work by other C. of E. installations.

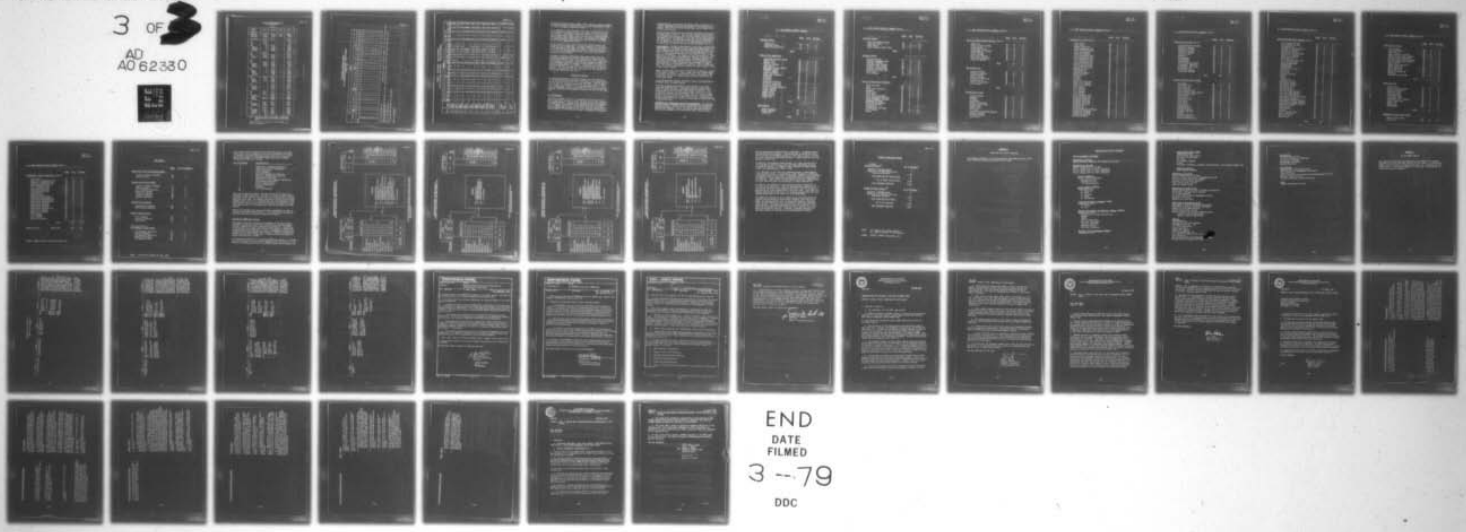
SOURCE: ENG FORMS 3018 b & c.

CHART C-5

AD-A062 330 KNIGHT (LESTER B) AND ASSOCIATES INC WASHINGTON DC F/G 15/3
STUDY TO IMPROVE REAL PROPERTY OPERATIONS AND MAINTENANCE IN TH--ETC(U)
OCT 78 T G CODY, J M KARIS, R L LAMP, W DOANE DACA73-77-C-0010

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CHART C-6

FY78 TOTAL ESTIMATED WORKLOAD, BY COSTS
(Including Land Payments)
3Q FY 78

$ Thousands

DIVISIONS & DISTRICTS	MILITARY 1	CIVIL WORKS 2	POSTAL 3	TOTAL 4
GRAND TOTAL	2,942,544	3,024,652	18,644*	5,985,840
Miscellaneous	62,071	52,982	18,644	133,697
Div Ofc Exp	12,997	59,351	-	72,348
Total Districts	2,867,476	2,912,319	-	5,779,795
EUD	220,816	-	-	220,816
HND	50,010	-	-	50,010
LMVD	85	560,074	-	560,159
Memphis	30	90,181	-	90,211
New Orleans	42	246,096	-	246,138
St. Louis	-	98,326	-	98,326
Vicksburg	13	125,471	-	125,484
MED	1,336,522	-	-	1,336,522
MRD	168,226	185,623	-	353,849
Kansas City	32,972	123,814	-	156,786
Omaha	135,254	61,809	-	197,063
NED	-	75,654	-	75,654
NAD	215,386	231,611	-	446,997
Baltimore	112,541	115,015	-	227,556
New York	52,585	30,041	-	82,626
Norfolk	50,260	17,650	-	67,910
Philadelphia	-	68,905	-	68,905
NCD	64	230,311	-	230,375
Buffalo	-	43,882	-	43,882
Chicago	64	39,008	-	39,072
Detroit	-	59,999	-	59,999
Rock Island	-	43,704	-	43,704
St. Paul	-	43,718	-	43,718
NPD	46,280	375,203	-	421,483
Alaska	44,446	42,632	-	87,078
Portland	-	157,203	-	157,203
Seattle	1,834	107,546	-	109,380
Walla Walla	-	67,822	-	67,822
ORD		338,048	-	338,048
Huntington	-	70,679	-	70,679
Louisville	-	101,141	-	101,141
Nashville	-	127,013	-	127,013
Pittsburgh	-	39,215	-	39,215
POD	118,462	24,976	-	143,438
SAD	298,099	375,318	-	673,417
Charleston	-	24,075	-	24,075
Jacksonville	-	102,501	-	102,501
Mobile	156,388	146,650	-	303,038
Savannah	141,711	48,105	-	189,816
Wilmington	-	53,987	-	53,987
SPD	152,278	197,765	-	350,043
Los Angeles	40,524	65,127	-	105,651
Sacramento	107,392	85,209	-	192,601
San Francisco	4,362	47,429	-	51,791
SWD	261,248	317,736	-	578,984
Albuquerque	555	23,204	-	23,759
Fort Worth	259,851	81,956	-	341,807
Galveston	333	62,718	-	63,051
Little Rock	261	38,286	-	38,547
Tulsa	248	111,572	-	111,820

NOTE: Excludes work by other Corps installations. Includes work for other Corps installations, other Government and Non-Government Agencies.

*For payment of contract claims applicable to various districts.

SOURCE: ENG FORMS 3018 b & c.

DIVISION OFFICE STAFFING RELATIONSHIP[1]

CIVIL, MILITARY AND POSTAL FUNCTIONS - CIVILIAN PERSONNEL*

31 March 1978

DIVISIONS	ELEMENTS																
	EXEC STAFF	PM	COMPT	GC	PROG DEV OFFICE	PERS	PAO	SAF	OFC ADMIN SVC	ADP	SUP	ENG	LAB	CON-ST	OPS	RE	PLNG
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TOTAL	32	2	206	50	52	75	28	12	143	168	18	393	162	58	98	99	225
LMVD	5	-	28	3	10	6	4	2	18	3	2	54	-	7	15	8	32
MRD	3	-	20	4	4	6	4	1	5	20	1	51	31	4	10	11	15
NAD	3	-	23	10	5	8	1	2	10	19		45	-	9	11	7	20
NCD	3	1	16[3]	5	6	6	4	1	10	18	1	31	-	3	9	36	29
NPD	5	-	31	6	5	7	3	3	16	33	8	53	30	4	12	8	20
ORD	3	-	15[3]	5	7	10	3	1	22	18	3	35	13	3	11	7	19
SAD	4	1	21	8	4	13	3	1	26	18	2	44	33	10	14	7	29
SPD	3	-	21	4	5	6	3	-	13	22	-	29	17	6	5	5	26
SWD	3	-	31	5	6	13	3	1	23	17	1	51	38	12	11	10	35

[1]Excludes Operating Divisions

*Includes Actual Strength - FTP;PTP;TPT; and WAEs on 807 as of end of reporting period.

[2]Includes personnel in Hydro Elec Design Br., Civ. Def., Trainees, Special Assistants, Aircraft Unit, WCSF, Reservoir Control Center, Value Engineers than normal staff

[3]Excludes Fin & Acctg Personnel

[4]Includes Comptroller Personnel (Fin & Acctg Center)

SOURCE: ENG FORM 4265-R

CHART C-7

DIRECT STAFFING RELATIONSHIP
CIVIL, MILITARY AND POSTAL CIVILIAN PERSONNEL

DIVISION	DISTRICTS	ELEMENTS																				OFFICE				
		EXEC. STAFF	PM SEC	COMPT	GC	PER	PAO	SAF	OFC ADM SVR	DRP	SUPPLY		ENG[2] OFC	ENG[2] FLD	CONST OFC	CONST FLD	OPS OFC	OPS FLD	RE OFC	RE FLD	Total Elements	Added Staff	Total 20 + 21	Field Total	Dist Total 22 + 23
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	TOTAL	100	24	1,435	325	761	144	107	1,825	984	1,401	694	8,737	892	1,366	3,023	2,652	9,910	1,233	280	20,720	1,001	21,721	14,105	35,826
LMVD	Memphis	4		31	7	22	4	4	41	18	30	37	194		14	80	26	337	29	8	466		466	425	891
	New Orleans	8	6	43	9	26	5	8	19	20	39	64	415	89	41	167	179	456	51	6	963	17	980	651	1,631
	St. Louis	3	1	36	6	18	4	2	30	16	26		311	31	20	58	48	393	32		571	3	574	477	1,051
	Vicksburg	3		44	5	30	7	7	40	13	39	65	280	50	25	139	147	577	41		746	3	749	766	1,515
NWD	Kansas City	4	1	43	14	28	5	4	40	16	22		325	39	27	128	59	225	102	31	690	2	692	423	1,115
	Omaha	5	1	64	13	31	6	3	76	9	28	63	366	33	38	145	77	358	102	34	882	59	941	570	1,511
NAD	Baltimore	3	3	70	26	32	4	4	52	13	23	69	276		36	109	71	73	54	23	736	297	1,033	285	1,318
	New York	2	3	46	10	19	1	2	26	12	28		177		22	47	79	76	43	-	470	43	513	123	636
	Norfolk	3	-	27	5	13	-	1	38	10	12		181		18	57	36	81	20	8	358		358	116	504
	Philadelphia	3	-	33	6	21	3	2	34	9	18		107		10	11	62	420	33	3	340	31	371	434	805
NCD	Buffalo	1	-	12	4	8	4	1	26	8	10		116		5	23	41	286	-	-	235	24	259	229	488
	Chicago	3	-	5	6	19	3	1	18		11		68	4	7	-	32	296	-	-	209	8	217	300	517
	Detroit	1	-	23	6	15	3	2	30	12	10		122	1	4	22	50	374	-	-	283	8	291	400	691
	Rock Island	2	-	23	4	13	3	2	26	15	10		141	12	6	18	40	255	-	-	285	5	290	286	576
	St. Paul	2	1	30	3	18	4	2	21	11	14		207		5	8	65	345	-	-	383	9	392	353	745
NPD	Alaska	3	-	29	4	13	3	1	33	10	15		186		57	44	-	-	17	-	351	1	352	44	396
	Portland	6	-	44	8	31	5	3	47	17	31		300	13	26	89	115	613	37	-	670	4	674	695	1,369
	Seattle	4	-	29	9	20	6	2	36	29	27		240		24	84	60	254	44	6	537	15	552	344	896
	Walla Walla	5	-	28	5	11	5	2	25	15	27		197		22	40	35	268	16	-	399	2	401	308	709
ORD	Huntsville	3	-	12	7	19	3	2	86	11	17	6	188	24	17	44	57	342	46	23	477	4	481	436	917
	Louisville	3	-	13	7	17	3	2	44	12	17	75	198	31	20	77	51	376	45	16	467	9	476	499	975
	Nashville	3	-	13	5	14	2	4	30	8	14		177	35	19	74	64	543	20	7	378	5	383	657	1,040
	Pittsburgh	1	-	9	6	16	3	1	33	6	12	-	196		8	27	29	433	16	-	296	6	302	460	762
SAD	Charleston	4	-	14	2	-	-	-	8	6	-	-	73	-	-	-	53	-	-	-	159	6	165	-	165
	Jacksonville	4	-	26	10	18	6	5	34	14	19	-	186	57	19	47	67	349	17	2	424	3	422	451	878
	Mobile	8	-	65	8	33	4	6	80	22	37	87	328	160	54	192	54	615	62	33	848	17	865	1,000	1,865
	Savannah	4	1	42	14	31	6	4	62	13	17	56	257	7	40	163	73	127	72	58	692	33	725	355	1,080
	Wilmington	5	-	14	3	9	3	1	18	8	6	-	118		4	13	36	184	-	-	225	14	239	197	436
SPD	Los Angeles	5	-	36	6	13	4	2	60	11	15		290	2	29	60	26	51	30	8	467	12	479	128	607
	Sacramento	2	1	44	6	18	2	3	62	16	25		374	3	92	169		147	40	-	675	54	729	319	1,048
	San Francisco	2	-	24	4	13	6	-	14		17		131		11	7	47	53	-	-	269	7	276	60	336
SWD	Albuquerque	2		16	3	8	3	2	12	6	4		102		31	1	37	20	19	-	245	-	245	21	266
	Fort Worth	3	2	57	19	28	5	5	37	23	21		399	21	63	206	45	229	74	14	781	7	788	470	1,258
	Galveston	1	-	19	9	12	3	2	28	16	11		155	31	6	23	40	101	16	-	316	7	323	235	558
	Little Rock	2	2	32	7	14	2	4	36	10	7		119	26	15		603	2	34	-	887	2	889	28	917
	Tulsa	4	-	39	12	18	4	3	46	12	9		320	44	15	88	71	518	70	-	622	2	624	650	1,274
EUD		4		65	7	5	1	1	57	21	30		208		53	255	-	-	-	-	452	6	458	296	713
HND		5	-	25	4	9	1	-	17	10	42		140	25	6	-	-	-	-	-	276	6	282	25	307
MED	MED (Rear)	2	-	20	4	12	1	-	30	23	22		102		35	-	-	-	-	-	321	35	356	-	356
	Div. Office	3	1	58	4	23	-	3	4	17	3		40	-	21	-	-	-	-	-	178	20	198	-	198
	Riyadh	2	-	4	3	-	-	-	-	-	20		-	-	122	38	-	-	-	-	160	-	160	35	195
	Jidda	6	-	5	2	-	-	-	-	-	21		-	-	80	40	-	-	-	-	133	-	133	45	178
	Al Batin	2	-	2	1	-	-	-	-	-	-		-	-	44	45	-	-	-	-	49	-	49	45	94
	Engr. Log Com'd	3	-		1	-	-	-	41	-	22		-	-	-	-	-	-	4	-	71	122	193	-	193
NED		5	-	34	11	17	3	1	33	9	17	82	164	-	18	37	65	133	27	-	486	49	535	170	705
POD	Div. Office	3	-	52	7	3	3	2	34	6	18	-		156	36	63	9	-	10	-	183	7	190	218	408
	Far East	1	1	9	-	-	-	-	53	-	8	-	110	-	29	59	-	-	-	-	211	2	213	59	272
	Japan	1	-	6	-	-	-	1	4	-	1	-	35	-	9	29	-	-	-	-	57	-	57	29	86

SOURCE: ENG FORM 4265 R

CHART C-8

Although only 11 districts in CONUS - 30% - have been formally assigned military construction responsibilities in certain geographical areas, all but 15, or 60%, do some military work.

It is important to note that 40% of this work force operates out of area, project or resident offices, while 60% is located in the central offices. These field offices are located at or near on-going Corps construction projects, usually on the site of completed water resource dams, locks, reservoirs, etc. The headquarters elements are usually located in GSA-leased facilities located in the major cities in their geographical areas.

Of the total work force, 11.8% are military funded employees and 88.2% are civil works-funded. A further breakout of the military-funded employees (1,800) shows that 75% are located in division and district offices and 25% in the field. A corresponding analysis of the civil-funded employees shows that almost half are located in the field offices.

In summary, the Corps of Engineers field organizations have the technical and administrative staffs necessary to support facility engineering services. Since field organizations, for the most part, are located at or near major installations, the general organizational framework needed to establish a consolidated facilities engineering organization is available. In addition, on the basis of review of the work load data and interviews with Corps of Engineers personnel, the division/district organization has the capacity to take on some additional work load.

Analysis of Savings

To identify the potential savings available from consolidation of the FE organizations and the Corps of Engineers field organizations, an analysis of the Norfolk District was performed. From the results of this analysis, assumptions were made regarding potential CONUS-wide savings. The analysis did not consider added staff for revolving fund management, since it is assumed that the existing Corps of Engineers revolving fund management systems can be used for the RPMA fund.

Norfolk Analysis

The Norfolk engineer district is assigned both military and civil works responsibilities and its staff includes several area, resident, and project offices. Located within the Norfolk district boundaries are three major installations, three subinstallations, and a GOCO plant. Norfolk area offices are located at Fort Lee, Fort Eustis, and the Radford Army Ordinance Plant. Real property offices are located at Fort A. P. Hill and Fort Pickett. Although not considered

a large district, it does have the typical range of skills (i.e., financial management, personnel administration, environmental expertise, legal and data processing knowledge, and all types of engineering disciplines).

Because of data limitations, this analysis considered only the Fort Lee, Fort Eustis, Fort A. P. Hill, and Fort Pickett installations. In performing this analysis, previous consolidation studies were relied upon, as well as comparison of the TDA's of the installations and the district. The functional areas that would be impacted are (1) the BASOPS support provided the FE organization and (2) the FE administrative, engineering, and resource management activities.

Common Support - Previous consolidation studies (Army and DMTC RPMA consolidation in the National Capital Region and consolidation of RPMA at Fayetteville, North Carolina) have analyzed the common support provided to the FE by other installation organizations. As a result, a reasonable determination of the amount of effort in man-years can be estimated. The support services considered are: MISO, Comptroller, AG, supply and procurement, movement, transportation, material maintenance, civilian personnel, and communications. In the study of the National Capital Region, it was estimated that support amounts to .086 man-years per FE staff member at each installation, while in the Fayetteville study, a ratio of .0879 was used. To provide a conservative estimate, the lower figure of .086 is used in this analysis.

Since, in many cases, work load is a fraction of a man-year, identifiable support manpower is a lower number than total common support. On the basis of previous consolidation studies, approximately 70% of the total man-years of support effort at each installation are identifiable spaces.

In the Norfolk area, analysis indicates a total of 59 identifiable personnel spaces of common support.

Since this proposed consolidation is no different in principle from other consolidations, it was determined that similar reductions in support personnel requirements could be achieved. Considering the results of previous consolidation studies it is conservatively estimated that approximately 25% of the support spaces at each installation could be eliminated when the various FE organizations are supported by a single support group. Consequently, a saving of approximately 14 support personnel spaces could be achieved in the Norfolk area.

Administrative, Engineering, and Resource Management - To identify potential savings in administrative, engineering, and resource management personnel, the TDA's of the installations and the Norfolk District were compared. (Chart C-9 contains the Norfolk District TDA and, as an example of the installation TDA's, Chart C-10 de-

U. S. ARMY ENGINEER DISTRICT, NORFOLK

	Grade	Civil	Military
Executive Office			
Clerk-Steno	04	0	1
Secretary (Steno)	07	1	0
Administrative Officer	12	1	0
TOTAL		2	1
Office of the Comptroller			
Accountable Property Officer	09	1	0
General Clerk	04	1	0
General Clerk	02	0	1
Secretary (Typing)	05	0	1
Clerk Typist	02	1	0
Management Analysis Officer	12	0	1
Management Analyst	09	1	0
Financial Manager	13	1	0
Accounting Officer	12	0	1
Supervisory Accountant	11	0	2
Accountant	09	1	0
Accountant	07	0	1
Accountant	05	1	0
Accounting Technician	07	0	1
Accounting Technician	05	3	2
Accounting Technician	04	2	1
Voucher Examining Supervisor	07	1	0
Voucher Examiner	05	1	0
Voucher Examiner	04	0	1
Budget Officer	12	1	0
Budget Analyst	11	0	1
Budget Analyst	09	0	1
Student Aid	00	2	0
TOTAL		17	14
Safety Office			
Safety Technician	04	1	0
Safety Engineer	12	0	1
Student Aid	00	1	1
TOTAL		2	1

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

	Grade	Civil	Military
Office of Counsel			
Contr Indus Relations Spec	07	0	1
Secretary (Steno)	05	1	0
Clerk Typist	02	1	0
Supvsy Attorney Advisor (Gen)	13	1	0
TOTAL		3	1
Personnel Office			
Personnel Officer	12	1	1
Personnel Management Spec	11	1	0
Personnel Assistant	07	1	0
Personnel Clerk (Typing)	05	1	0
Personnel Clerk (Typing)	04	2	0
Personnel Staffing Spec	09	0	1
Employee Development Spec	11	1	1
Clerk Typist	03	0	1
Civil Engineer	05	0	3
TOTAL		7	7
Office of Administrative Services			
Guard Supervisor	04	0	1
Guard	03	0	4
Travel Clerk (Typing)	04	1	0
Messenger	02	2	0
Clerk Typist	03	3	1
Clerk Typist	02	0	2
Office Services Manager	10	0	1
Supvsy Management Assistant	07	1	0
Supvsy Management Assistant	06	1	1
Management Assistant	05	0	1
Office Machine Operator	02	0	1
Teletypist (Typing)	04	1	1
Photographer	07	1	0
Transportation Assistant	05	1	1
Labor Foreman	03	2	0
Laborer	02	4	0

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

	Grade	Civil	Military
Office of Administrative Services (Cont'd)			
Summer Aid	00	10	0
Print and Repro Foreman	10	1	0
Bindery Worker	07	0	1
Lithographic Helper	04	0	1
Film Assembler, Stripper	08	0	1
Offset Pressman	11	1	0
Offset Pressman	07	0	1
Diazo Equip Operator	06	0	1
Motor Vehicle Operator	05	2	0
Automotive Mechanic	11	1	0
TOTAL		32	19
ADP Office/Center			
Secretary (Steno)	05	1	1
Computer Technician	08	0	1
Data Transcriber	04	1	0
General Engineer	12	1	0
Engineering Technician	05	1	0
Engineering Aid	04	1	0
Supvsy Civil Engineer	13	0	1
Civil Engineer	11	0	1
TOTAL		6	5
Engineering Division			
Supvsy Economist	13	2	0
Economist	11	1	0
Economist	09	1	0
Sociologist	11	1	0
Reports & Funds Asst	07	1	0
Project Control Clerk	05	2	2
General Clerk	04	1	3
General Clerk	03	2	0
File Clerk	02	0	1
Clerk-Dictating Machine Operator	04	0	1
Secretary (Steno)	06	1	0
Secretary (Typing)	05	1	1
Clerk Typist	04	1	0

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

	Grade	Civil	Military
Engineering Division (Cont'd)			
Clerk Typist	03	4	3
Clerk Typist	02	2	5
Computer Specialist	11	1	0
Supvsy Management Asst	06	1	0
Funds & Reports Analyst	08	0	1
Supvsy Gen Engineer	14	1	0
Supvsy Gen Engineer	13	1	0
Civil Engineering Tech	11	1	1
Supvsy Engineering Tech	10	1	1
Civil Engineering Tech	09	1	2
Civil Engineering Tech	08	2	0
Civil Engineering Tech	07	2	3
Engineering Technician	06	1	2
Civil Engineering Tech	05	1	0
Engineering Technician	04	2	1
Engineering Aid	03	1	0
Engineering Aid	02	1	2
Landscape Architect	12	1	1
Supvsy Architect	13	0	1
Architect	12	1	1
Architect	11	0	1
Architect	09	1	2
Supvsy Civil Engineer	15	1	0
Supvsy Civil Engineer	14	2	1
Supvsy Civil Engineer	13	9	3
Civil Engineer	12	9	6
Civil Engineer	11	6	4
Civil Engineer	09	5	1
Civil Engineer	07	2	1
Civil Engineer	05	4	1
Supvsy Surveying Tech	09	3	0
Supvsy Surveying Tech	08	2	0
Surveying Technician	07	1	1
Surveying Technician	06	1	0
Surveying Technician	05	4	1
Surveying Technician	04	1	1
Surveying Aid	03	5	1
Surveying Aid	02	5	1
Supvsy Engineering Draftsman	07	0	1
Engineering Draftsman	05	1	1
Engineering Draftsman	04	0	3
Engineering Draftsman	03	1	1
Sanitary Engineer	12	0	1

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

	Grade	Civil	Military
Engineering Division (Cont'd)			
Supvsy Mechanical Engineer	13	0	1
Mechanical Engineer	12	1	2
Mechanical Engineer	11	0	1
Mechanical Engineer	09	0	2
Electrical Engineer	12	1	1
Editorial Clerk	04	1	0
Geologist	11	0	2
Oceanographer	12	2	0
Oceanographer	11	1	0
Oceanographer	07	1	0
Carto Technician (Photo)	10	1	0
Cartographic Technician	06	1	0
Cartographic Technician	05	1	0
Cartographic Aid	03	2	0
Survey Boat Operator	10	1	0
Survey Boat Operator	08	2	0
TOTAL		120	77
Construction-Operations Division			
Park Ranger	09	1	0
Supvsy Park Tech	07	2	0
Park Technician	05	3	0
Park Technician	04	1	0
Funds & Reports Asst	07	0	1
Funds & Reports Clerk (Typing)	05	2	2
Project Control Clerk	04	2	1
Clerk (Typing)	03	0	1
Clerk-Steno	05	1	0
Secretary (Steno)	06	1	0
Clerk Typist	04	2	0
Clerk Typist	03	2	1
Clerk Typist	02	0	1
Program Analyst	09	0	1
Program Analyst	05	1	0
Biologist (Marine)	09	1	0
Biologist (Marine)	05	2	0
Forester	07	1	0
Forestry Technician	05	2	0
Forestry Technician	04	7	0
Supvsy Engineering Tech	12	1	0

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

	Grade	Civil	Military
Construction-Operations Division (Cont'd)			
Civil Engineering Tech	11	1	3
Civil Engineering Tech	10	1	1
Engineering Aid	03	1	0
Construction Representative	07	1	0
Construction Inspector	06	2	0
Compliance Inspector	04	1	0
Construction Inspection Aid	03	3	0
Supvsy Civil Engineer	14	1	0
Supvsy Civil Engineer	13	3	0
Civil Engineer	12	1	1
Civil Engr (Emer Oper Plnr)	11	1	0
Supvsy Oceanographer	12	1	0
Supvsy Oceanographer	11	2	0
Oceanographer	09	2	0
Oceanographer	07	3	0
Statistical Assistant	05	4	0
Electrician	11	3	0
Electrician	10	1	0
Electrician Helper	05	1	0
Laborer	03	4	0
Laborer	02	3	0
Student Aid	00	14	1
Carpenter (Marine)	10	1	0
Maintenance Foreman	09	4	0
Maintenance Mechanic	10	1	0
Maintenance Worker	08	1	0
Maintenance Man	06	1	0
Head Dam Operator	10	2	0
Lock and Bridge Operator	09	4	0
Lock and Bridge Operator	08	17	0
Lock and Bridge Operator	07	6	0
Lock and Bridge Operator Helper	05	2	0
Motor Vehicle Operator	07	5	0
Engineering Equipment Operator	10	5	0
Heavy Mobile Equipment Mechanic	11	1	0
Heavy Mobile Equipment Mechanic	08	1	0
Automotive Mechanic	11	1	0
Boat Operator	10	1	0
Tender Operator	07	4	0
Deckhand	06	4	0
Chief, Engineer Diesel	12	2	0
Master, Tug Class I	13	1	0
Mate Tug Class I	09	1	0
Marine Oiler	08	1	0
TOTAL		152	14

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

	Grade	Civil	Military
Real Estate Division			
Clerk (Typing)	04	0	1
Secretary (Steno)	06	1	0
Clerk Typist	03	0	2
Supvsy Forestry Tech (TM)	09	0	1
Supvsy Forestry Tech (TM Mgmt)	08	0	1
Forrestry Tech (Timbr Mgmt)	05	0	5
Attorney Advisor (Real Property)	12	1	0
Misc Documents Clerk (Typing)	05	1	0
Realty Officer	13	1	0
Supvsy Realty Specialist	12	0	2
Realty Specialist	11	2	3
Realty Specialist	09	1	1
Realty Specialist	07	0	1
Supervisory Appraiser	12	1	0
Appraiser	11	0	1
Cartographic Technician	05	1	0
TOTAL		9	18
Supply Division			
Clerk Typist	02	0	1
Supvsy Procurement Agent	11	1	0
Contract Specialist	09	2	0
Purchasing Agent	07	1	0
Purchasing Agent	05	0	1
Procurement Clerk	06	0	1
Procurement Clerk	05	1	0
Procurement Clerk (Typing)	04	1	0
General Supply Spec	09	0	1
Supply Clerk	04	1	0
Student Aid	00	3	0
Warehouseman	03	0	1
TOTAL		10	5
Southwestern Virginia Area Office			
General Clerk (Steno)	04	1	3
Clerk Typist	03	0	4

U. S. ARMY ENGINEER DISTRICT, NORFOLK (Cont'd)

		Grade	Civil	Military
Southwestern Virginia Area Office (Cont'd)				
Clerk Typist		02	0	1
Supvsy Civil Engineering Tech		12	0	3
Electrical Engineering Tech		11	0	3
Mechanical Engineering Tech		09	0	2
Civil Engineering Tech		07	0	2
Civil Engineering Tech		06	0	1
Engineering Technician		05	3	1
Civil Engineering Tech		04	0	2
Engineering Aid		03	2	1
Engineering Aid		02	0	2
Supvsy Construction Rep		13	0	1
Construction Representative		11	0	1
Construction Representative		10	0	2
Construction Representative		09	2	0
Construction Inspector		07	0	1
Construction Inspector		06	1	0
Construction Inspector		05	2	1
Construction Inspector Aid		03	0	1
Supvsy Civil Engineer		14	0	1
Supvsy Civil Engineer		13	1	2
Civil Engineer		11	0	5
Civil Engineer		09	2	3
Civil Engineer		05	0	1
Electrical Engineer		11	0	1
	TOTAL		14	45
NORFOLK DISTRICT	GRAND TOTAL		474	197

SOURCE: NORFOLK DISTRICT TDA AS OF 30 JUNE 1978

FORT EUSTIS

	Grade	No. of Personnel
Engineering Plans and Services Branch		
Supervisor General Engineer	13	1
Engineer Clerk	05	1
Engineering Services Branch		
Supervisor General Engineer	12	1
General Engineer	11	1
Civil Engineer Technician	11	0
Mechanical Engineer	11	2
Electrical Engineer	11	1
Engineer Technician	09	1
Engineer Draftsman	09	2
Construction Inspection		
Construction Inspector	09	1
Construction Inspector	07	4
Master Planning Branch		
Civil Engineer	12	1
Engineer Technician	11	1
Clerk Steno	04	1
Utilities Division - Environmental Energy Branch		
Environmental Specialist	12	1
Sanitary Engineer	12	1
Environmental Specialist	11	1
Mechanical Engineer	11	1
Environmental Clerk	05	1

SOURCE: FORT EUSTIS PARTIAL TDA JUNE, 1978

picts that portion of the Fort Eustis TDA that would be affected.) On the basis of this comparison, as well as interviews with Corps of Engineers personnel regarding district work load, it was estimated that a total of 24 personnel spaces could be eliminated through consolidation as follows:

No. of Personnel		Function/Title
3	-	Supervisors of General Engineering
1	-	Supervisor of Civil Engineering
3	-	General Engineers
4	-	Civil Engineers
1	-	Mechnical Engineering Technician
1	-	Electrical Engineering Technician
3	-	Engineering Technicians
1	-	Supervisor of Environmental Engineering
1	-	Environmental Specialist
1	-	Forestry Administrator
2	-	Forestry Technicians
1	-	Draftsmen
2	-	Clerk-Stenographers
24		

These space reductions result from the elimination of supervisory positions at each installation, the ability to utilize the technical resources of the district, and the ability of the district to assume additional work load. For example, the Norfolk District has 64 civil engineers and, even if it is assumed that the civil engineers at the installations are fully utilized, the reduction of three civil engineers would result in an increased work load at the district of less than 5%.

Charts C-11 through C-14 show the personnel complements of each installation and the Norfolk District. Also depicted are the specific personnel positions eliminated through consolidation.

Estimate of CONUS-Wide Savings

Fort Eustis, which has a personnel complement of 326 and an annual FE budget estimated at $13 million to $14 million, can be categorized as a typical facilities engineering organization. The analysis of the Norfolk area showed that a total of 15 spaces (5 support and 10 administrative engineering and resource management) could be eliminated at Fort Eustis through consolidation. Therefore, considering 94 major active installations there is potential for elimination of about 1,410 personnel in CONUS.

An alternative procedure for estimating CONUS-wide savings is to assume that consolidation of the FE and CE organizations would result in a reduction of 38 spaces per district (14 BASOPS spaces and 24 spaces from

ESTIMATED SAVINGS – INTEGRATION OF DISTRICT, AREA OFFICE AND FE FORT EUSTIS

FORT EUSTIS INSTALLATION

	BASOPS		
	FE	OTHER	
RECOGNIZED	398	2401	SPT FE 21
AUTHORIZED	326	1920	

	RECOG	AUTH	SAV
ERMD	2	1	
WORK RECEPTION	4	4	
ESTIMATING	5	3	
IND ENGRG	1	1	
PROG & BUDGET	7	7	
REAL PROP	4	3	9
ENGR, PLANS & SERV	2	2	
CONSTR INSP	5	4	
ENGR SERV	11	6	
MASTER PLAN	3	3	
TOTAL	44	34	9

ALL OTHER FUNCTIONS	354	292	1

5

9

10

1

SAVINGS

5 EA – COMMON SUPPORT
2 EA – SUPERVISOR, GENERAL ENGINEERING GS-12
1 EA – CIVIL ENGINEER GS-12
1 EA – SUPERVISOR CIVIL ENGINEERING TECHNICIAN GS-12
1 EA – ENGINEERING TECHNICIAN GS-11
1 EA – CLERK STENO GS-4
1 EA – CIVIL ENGINEERING GS-9
1 EA – ENGINEERING TECHNICIAN GS-9
1 EA – GENERAL ENGINEER GS-11
1 EA – ENVIRONMENTAL SPECIALIST GS-11

15 – TOTAL SPACES

NORFOLK DISTRICT

FIELD	OFFICE	
116	364	MC & CW

		PLAN
	181	ENGRG
44	18	CONSTR
60	30	OPNS
7	20	REAL ESTATE
	27	CONTROLLER
	38	ADMIN
	10	ADP
	12	SUPV
	13	PERS
5	15	MISC
116	364	TOTAL

NOTE: FORT EUSTIS HAS A SUB-INSTALLATION AT FORT STOREY BUT IT RECEIVES RPMA SERVICES FROM THE NAVY PUBLIC WORKS CENTER.

CHART C-11

ESTIMATED SAVINGS – INTEGRATION OF DISTRICT, AREA OFFICE AND FORT PICKETT FE

PICKETT INSTALLATION

	BASOPS		
	FE	OTHER	
RECOGNIZED	109	263	SPT FE 12
AUTHORIZED	100	210	

	RECOG	AUTH	SAV
ERMD	1	1	
WORK RECEPTION	1	1	
ESTIMATING	3	2	
IND ENGRG			
PROG & BUDGET			
REAL PROP			
ENGR, PLANS & SERV	1	1	
CONSTR INSP	1	1	
ENGR SERV	4	3	1
MASTER PLAN	0	0	
TOTAL	11	9	1

ALL OTHER FUNCTIONS	98	91	1

3

1

2

1

SAVINGS

3 EA – COMMON SUPPORT
1 EA – SUPERVISOR OF ENVIRONMENTAL ENGINEERING GS-12
1 EA – FORRESTRY TECHNICIAN
5 – TOTAL SPACES

NORFOLK DISTRICT

FIELD	OFFICE	
116	364	MC & CW

		PLAN
	181	ENGRG
44	18	CONSTR
60	30	OPNS
7	20	REAL ESTATE
	27	CONTROLLER
	38	ADMIN
	10	ADP
	12	SUPV
	13	PERS
5	15	MISC
116	364	TOTAL

NOTE: FORT PICKETT IS A SUB-INSTALLATION OPERATING UNDER FORT LEE.

CHART C-12

ESTIMATED SAVINGS – INTEGRATION OF DISTRICT, AREA OFFICE AND FE FORT LEE

FORT LEE INSTALLATION

	BASOPS		
	FE	OTHER	
RECOGNIZED	347	1890	SPT FE 16
AUTHORIZED	267	1513	

4

	RECOG	AUTH	SAV
ERMD	2	1	
WORK RECEPTION	4	4	
ESTIMATING	9	8	
IND ENGRG	1	0	
PROG & BUDGET	5	5	
REAL PROP	2	2	9
ENGR, PLANS & SERV	2	2	
CONSTR INSP	4	3	
ENGR SERV	8	8	
MASTER PLAN	3	3	
TOTAL	40	36	9

9

ALL OTHER FUNCTIONS	307	231	0

SAVINGS

4 EA – COMMON SUPPORT
1 EA – SUPERVISOR GENERAL ENGINEERING GS-12
2 EA – GENERAL ENGINEER GS-11
1 EA – CLERK STENO GS-4
2 EA – CIVIL ENGINEER GS-11
1 EA – MECHANICAL ENGINEERING TECHNICAL GS-11
1 EA – ELECTRICAL ENGINEERING TECHNICIAN GS-11
1 EA – ENGINEERING DRAFTSMAN GS-7

13 – TOTAL SPACES

NORFOLK DISTRICT

FIELD	OFFICE	
116	364	MC & CW

		PLAN
	181	ENGRG
44	18	CONSTR
60	30	OPNS
7	20	REAL ESTATE
	27	CONTROLLER
	38	ADMIN
	10	ADP
	12	SUPV
	13	PERS
5	15	MISC
116	364	TOTAL

NOTE: FORT LEE HAS TWO SUB-INSTALLATIONS FORT A.P. HILL AND FORT PICKETT.

CHART C-13

ESTIMATED SAVINGS – INTEGRATION OF DISTRICT, AREA OFFICE AND FORT A.P. HILL FE

A.P. HILL INSTALLATION

	BASOPS		
	FE	OTHER	
RECOGNIZED	96	226	SPT FE 10
AUTHORIZED	84	181	

	RECOG	AUTH	SAV
ERMD	1	1	
WORK RECEPTION	1	1	
ESTIMATING	2	2	
IND ENGRG			
PROG & BUDGET	1	1	
REAL PROP			1
ENGR, PLANS & SERV	1	1	
CONSTR INSP	1	1	
ENGR SERV	6	5	
MASTER PLAN	0	0	
TOTAL	13	12	1

ALL OTHER FUNCTIONS	83	72	2

2

1

2

3

NORFOLK DISTRICT

FIELD	OFFICE	
116	384	MC & CW

		PLAN
	181	ENGRG
44	18	CONSTR
60	30	OPNS
7	20	REAL ESTATE
	27	CONTROL-LER
	38	ADMIN
	10	ADP
	12	SUPV
	13	PERS
5	15	MISC
116	384	TOTAL

SAVINGS

2 EA – COMMON SUPPORT
1 EA – ENGINEERING TECHNICIAN GS-9
1 EA – FORRESTRY TECHNICIAN GS-5
1 EA – FORRESTRY ADMINISTRATOR GS-9

5 – TOTAL SPACES

NOTE: FORT A.P. HILL IS A SUB-INSTALLATION OPERATING UNDER FORT LEE.

CHART C-14

the FE engineering and administrative complement), as demonstrated by the Norfolk District analysis. Multiplying the 38 spaces by 37 districts provides an estimated savings of 1,406 spaces, which is consistent with the results described previously. These reductions are summarized in Chart C-15.

In addition, the Engineer Studies Center, U.S. Army, and the Facilities Engineering Directorate of OCE performed independent analyses of potential savings. In summary, their estimates of CONUS savings ranged from approximately 1,000 to 1,500.

It is important to note that the estimated savings of approximately 1,400 personnel spaces is conservative, since, because of limitations in available data, not all areas of potential savings could be analyzed. The MACOM facilities engineering organizations were not considered in the analysis. These staffs are now directly involved in RPMA performance and reductions may also be possible in these organizations.

In addition, the analysis did not consider potential reductions in the blue collar work force. With the organizational separation of recurring and nonrecurring maintenance activities, there is a greater opportunity for closer supervision of the work force. Over time, this greater supervision should result in increased productivity and a corresponding decrease in the total work force requirement.

The CONUS-wide analysis based on reductions at one installation considered only the 94 major installations; however, there are also a number of subinstallations and, as the Norfolk analysis indicates, these subinstallations can also contribute to additional personnel space savings. The CONUS-wide analysis based on a district is also conservative because the Norfolk District has a smaller work load than the average CE district. Therefore, projected reductions in personnel spaces are considered the minimum potential savings.

ESTIMATED CONUS-WIDE SAVINGS

Average Installation Basis[1]	No. of Personnel
Reduction in Basops Support	5
Reduction in FE Administration and Engineering Personnel	10
TOTAL REDUCTION PER INSTALLATION	15
(No. of Major Installations)	x 94
TOTAL PERSONNEL REDUCTION	1,410

Average CE District Basis[2]	No. of Personnel
Reduction in BASOPS Support	14
Reduction in FE Administration and Engineering Personnel	24
TOTAL REDUCTION PER DISTRICT	38
(No. of CE Districts)	x 37
TOTAL PERSONNEL REDUCTION	1,406

NOTES: (1) Based on Fort Eustis Analysis
(2) Based on Norfolk District Analysis

SOURCE: LESTER B. KNIGHT & ASSOCIATES, INC.

APPENDIX D

Interviews and Visits Conducted

This appendix presents a list of the persons interviewed and the visits which took place during the course of this study.

Interviews and Visits Conducted

Office Management and Budget

Department of Defense
Deputy Assistant Secretary (Environment and Safety)

Department of the Army
Office, Comptroller of the Army
Office, Deputy Chief of Staff, Logistics
Office, Deputy Chief of Staff, Operations
Office, Deputy Chief of Staff, Personnel

Corps of Engineers
Office, Chief of Engineers
- European Division
- Southwest Division
  - Ft. Worth District

Forces Command (FORSCOM)
Headquarters Staff
- Ft. McPherson
- Ft. McCoy
- Ft. Sheridan
- Ft. Bragg
- Ft. Sam Houston

Training and Doctrine Command (TRADOC)
Headquarters Staff
- Ft. Monroe
- Ft. Sill

Materiel Development and Readiness Command (DARCOM)
Headquarters Staff
- Installations and Services Activity
- AARCOM
- DESCOM
- Rock Island Arsenal
- Lone Star Army Depot
- Anniston Army Depot
- Redstone Arsenal
- Red River Army Depot

Military Traffic Management Command
Headquarters Staff

United States Army, Europe
Headquarters Staff
United States Army, Berlin
VII Army Training Center
VII Corps
21st Support Command
V Corps
Grafenwohr, Nurnberg, Stuttgart, Kaiserslautern, and Frankfurt Communities

Reserve Activities
416th Engineer Command

Department of the Navy
Office, Comptroller of the Navy
Director of Shore Facilities, Programming Division
Naval Facilities Engineering Command
Engineer Field Division, Norfolk
Public Works Center, Norfolk
Naval Air Rework Center

Department of the Air Force
Office, Deputy Chief of Staff, Programs and Resources
Directorate, Engineering and Services
Air Training Command
San Antonio Real Property Management Activity
Vance Air Force Base
Randolph Air Force Base

Other Federal Government Offices
Department of Health, Education, and Welfare
Department of Housing and Urban Development
General Services Administration
United States Postal Service
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Marshall Space Flight Center

Industry
IBM Corporation
International Harvester Company
Montgomery Ward & Co., Inc.
U.S. Steel Corporation
Exxon Corporation
Peoples Gas Company
Santa Fe Industries, Inc.
E. I. DuPont de Nemours & Co., Inc.
FMC Corporation
Baird & Warner Real Estate Managem[illegible]mpany
Chicago and North Western Railroad

Universities
University of Illinois
Illinois Institute of Technology
University of Chicago
Northwestern University
Harvard University

Associations
American Public Works Association
International City Management Association
Urban Institute
National Association of Housing and Redevelopment Officials
National League of Cities
California Contract Cities Association

Other
Michael Reese Medical Center

APPENDIX E

DA and MACOM Comments

This appendix categorizes and summarizes DA and MACOM staff comments regarding the 5 July 1978 draft version of this report. The summarized comments and the Lester B. Knight & Associates, Inc. responses are presented herein. The original comments, as received, are reproduced following the summarized comments.

O&M/RPMS PHASE II CONTRACT STUDY

SUMMARY OF REVIEW COMMENTS

TOPIC	FORSCOM	TRADOC	DA STAFF	LBK RESPONSE
A. Mission Responsiveness	Decreased responsiveness and customer satisfaction	Current ACMS more responsive to mission and customer requirements	DCSOPS 1. Performance during mobilization not addressed 2. Conflicts with ACMS DCSPER Should improve customer satisfaction and reduce BMAR in support of Quality of Life improvements DCSLOG Need more assurance of increased responsiveness	1. The current system is designed to be responsive through its provision for delegation of authority to the commander. However, it is important to assess responsiveness not only in terms of willingness to perform but also in terms of ability to perform. Therefore, because of severe personnel resource constraints, the level of responsiveness of the present system will be reduced. Since the recommended system results in greater availability of technical skills, responsiveness should improve rather than decrease. 2. Experience with revolving funds in the Navy and elsewhere has not indicated any reductions in responsiveness.

TOPIC	FORSCOM	TRADOC	DA STAFF	LBK RESPONSE
B. Management Flexibility in Resource Allocation	Existing constraints make mission performance difficult No improvement in engineer resource shortfalls Places decision-making and prioritization with COE, reducing commander's flexibility	Stovepipe takes management prerogatives and flexibility away from commanders Revolving fund increases cost of FE activities Reduces commander's options and ability to influence priorities	DCSOPS Appears to adversely impact on commander's flexibility to deal with funding process and maintenance requirements DCSPER Will detract or erode commander's flexibility DCSLOG Resource control and flexibility must remain with MACOM	1. The control of financial resources as well as responsibility for planning and priority-setting remains with commanders under the revolving fund concept. 2. The cost of FE services is not increased under the revolving fund. The revolving fund does, however, identify total costs. Unlike the present system, the proposed system will make visible the total cost of FE services. In addition, the Navy has experienced reductions in total requirements once total costs are identified. 3. The commander's flexibility in allocation of personnel resources is reduced in the proposed system. However, the study indicates that this change in responsibility is needed to improve RPMA and the overall RPMS.

TOPIC	FORSCOM	TRADOC	DA STAFF	LBK RESPONSE
C. Quality and Detail of Study	No data presented on adequacy of current District support Study presents concept only. Does not analyze feasibility, cost, geographical distance, and other factors Following not addressed: 1. Support of Reserve Components 2. Engineer support of combat organizations 3. Impact on mobilization and force readiness	Does not address the real problem of overall management of resources for competing missions at installation level	DCSOPS 1. Insufficient detail on merits and capability of preferred alternative 2. Cost and personnel savings need to be quantified DCSPER Additional data on staffing and revolving fund required DCSLOG Include proposed changes in support areas	1. The final report contains cost data comparing the proposed system with the current system. These data indicate that significant potential savings are available. Also, the recommendation to implement a new management concept is not and should not be based solely on cost savings. Any new system should offer improved management and technical direction. These are advantages that are not readily translated to dollar or personnel costs. 2. Additional areas of force readiness, Reserve Center support, and installation support are addressed in the final report.

TOPIC	FORSCOM	TRADOC	DA STAFF	LBK RESPONSE
D. Implementation Problems	Present districts not oriented to FE work, lack expertise Realignment of district functions and organization could be extensive and costly	Removal of engineering and resource management capability from installation will increase problems of the FE Removal of engineering capability will increase reaction times and project development costs	DCSOPS Conduct test before full Army commitment DCSPER Field test necessary to evaluate concerns DCSLOG 1. Returns to pre-1962 operator/manager role for COE 2. Test concept over a five-year period	1. The district orientation toward FE activities should be improved through implementation and operation of the the "One-Stop" support concept. 2. The engineering and resource management capability will not be fully removed from the installation. Rather, through consolidation of area office and installation personnel, a larger pool of expertise will be available within close proximity of the installation. 3. Pilot tests of the proposed system are recommended to further define operations, etc.

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
DAMO-ODU	Study to Improve Real Property Operations and Maintenance in the US Army

TO DAEN-FER FROM DAMO DATE 17 AUG 1978 CMT 1
MAJ Herndon/apv/78583

1. Reference memorandum, DAEN-FER to BG Renick, 31 July 1978, subject: Study Advisory Group (SAG) Meeting - Real Property Management System (RPMS) Study.

2. In accordance with the referenced memorandum, the following comments to the subject study are submitted.

a. Although the basis for the new organization is understood to be systems logic, it is impossible to judge the merits of the new organization without cost and personnel savings quantified to some degree. The current manpower and funding levels should be compared to estimated future levels to quantitatively measure the savings generated by the new system.

b. The study does not address how the new organization would perform during mobilization. Would the new organization be responsive to the installation commander for the intense and extensive engineering requirements during mobilization?

c. The authors of the study correctly recognize that such a reorganization is in conflict with the Army's philosophy of providing maximum authority to installation commanders. Such an organization would appear to create an adverse impact on the installation commanders' flexibility to deal with the dynamics of the funding process and maintenance requirements.

d. The study has insufficient detail as to the merits and capability of the new organization. As a minimum, it appears that a test should be conducted before committing the Army to such a change with so little detailed rationale.

3. Until these issues are clarified, ODCSOPS reserves judgment on the subject study.

4. Request MACOM comments be provided for ODCSOPS review before final recommendation to VCSA/CSA.

FOR THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS:

for John A Keutmann

JOHN C. FAITH
Major General, GS
Director of Operations
and Plans

JOHN A. KEUTMANN
COL, GS
Assistant Director

DA FORM 1 FEB 67 2496 REPLACES DD FORM 96, WHICH IS OBSOLETE.

☆GPO-1975-663-422/1003

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
DAPE-HRC-H	ODCSPER Comments: RPMS Study

TO DAEN-FER FROM DAPE DATE 14 AUG 1978 CMT 1

MAJ Barta/ro/53120

1. Reference memorandum for RPMS SAG members, DAEN-FER, subject: SAG Meeting - RPMS Study, dated 31 July 1978.

2. Comments as requested in para 3b and 4, reference, follow:

a. The ODCSPER is concerned with any alternative which will detract or erode the commanders' flexibility in accomplishing the mission. Specifically, removal of any function now controlled at the installation level may be perceived by commanders as a further erosion of field prerogative. Installation Master Planning, for example, is a function that commanders may want to retain even though provisions are made for accomplishment at the District Engineer level.

b. Narrowing the scope of the Facility Engineer (FE) to allow concentration on Operation and Maintenance (O&M) activities should serve to improve customer satisfaction and reduce the backlog of maintenance and repair in support of Quality of Life improvements.

c. In reference to personnel management, the addition of a staff engineer and provisions for a career path for FE's should not pose a problem in that management of these two positions could be accommodated under the current 21C Speciality (Engineer Management Officer). However, additional data (regarding the increased staff) for accounting and revolving fund administration is required.

3. In summary, the ODCSPER position favors the preferred alternative provided the commander retains sufficient control of resources required for mission accomplishment in the broad area of QOL issues. A field test is highly encouraged to allow adequate evaluation of the above concerns.

FOR THE DEPUTY CHIEF OF STAFF FOR PERSONNEL:

Patrick R. Lowrey

PATRICK R. LOWREY
Colonel, GS
Acting Director of Human
Resources Development

DA FORM 1 FEB 62 2496 REPLACES DD FORM 96, WHICH IS OBSOLETE. ☆GPO-1975-665-422/1063

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
DALO-RMP	Review of O&M-RPMS Phase II Draft Report

TO DAEN-FER-P FROM DALO-RMP DATE 24 AUG 1978 CMT 1

Mr. Metzger/dah/45490

1. Ref your DF, this subject, 27 Jul 78, and SAG meeting 4 Aug 78.

2. During referenced SAG meeting the contractor stated that the recommended alternative - an engineering command using a revolving fund - would produce cost savings in functional, transaction, and organizational areas from centralization, which will be documented in final report.

3. This office agrees with the approach of prototype testing the preferred alternative rather than implementing the short range plan providing the contractor identifies savings and fully addresses:

a. Effect on other BASOPS, e.g., supply, personnel and transportation. The DCSLOG has responsibility for most of the remainder of BASOPS functions after RPMA is removed. We are interested in applying the knowledge gained from this O&M-RPMS study to the remainder of BASOPS. Recommendations of this study appear to have a significant impact on all BASOPS. Request that close coordination be maintained with ODCSLOG to ensure maximum benefit is derived from future study/testing.

b. Surety that proposed new organization will be more responsive.

c. Navy Public Works (NPW) Center system to determine anticipated savings. NPW centers have been established for several years and apparently have resulted in more efficient and economical utilization of engineering resources.

4. It is deemed essential that resource control and flexibility, in areas of RPMA planning and funds allocation, remain with the MACOM. It is requested that the final study include any proposed changes in support areas to include:

a. M&S equipment management.

b. Supply policy and procedure.

c. Transportation Support for FEs.

d. Energy mission/workload.

e. ISSAS and Consolidation.

f. Impact on the DIO and responsibility for facilities utilization assignment.

DALO-RMP

24 AUG 1978

SUBJECT: Review of O&M-RPMS Phase II Draft Report

5. A consideration of this proposal is that if the Army follows the long range objectives in this implementation the COE will be restored to the operator/manager role of the era of technical services prior to the 1962 reorganization of the Army. Also recent RPMA consolidation studies indicate that potential for economical savings rests with consolidation of all BASOPS rather than only RPMA. Request this be addressed in the final report. Recommend final report be used by DA Staff (SAG) as basis for a decision with respect to testing the concept over a five year period.

FOR THE DEPUTY CHIEF OF STAFF FOR LOGISTICS:

for Daniel M. Cook LTC

CHARLES M. MURRAY
COL, GS
Chief, Programs Division

DEPARTMENT OF THE ARMY
OFFICE OF THE COMPTROLLER OF THE ARMY
WASHINGTON, D.C. 20310

DACA-OMB

25 AUG 1978

MEMORANDUM FOR THE CHAIRMAN OF THE STUDY ADVISORY GROUP

SUBJECT: Review of O&M - RPMS Phase II Draft Report

1. Reference is made to:

a. DF, DAEN-FER-P, 31 July 1978, same subject.

b. Memo for BG Corey J. Wright, Director of Operation and Maintenance, Army, OCA, 31 July 1978, subject: Study Advisory Group (SAG) Meeting - Real Property Management System (RPMS) Study.

2. This office has reviewed the Lester Knight RPMA study and has the following comments:

a. The references use the terms Operation and Maintenance (O&M) in such a way that it appears interchangeable with Operation and Maintenance, Army (OMA), i.e., on page 4 of the Executive Summary reference is made to J, K, L, and M accounts. The only two appropriations that use these accounts are OMA and Operation and Maintenance, Army Reserve (OMAR). The study should clarify that Operation and Maintenance of RPMA applies equally to the Army Industrial Fund; Research, Development, Testing and Evaluation, Family Housing Management Account (O&M), etc.

b. The Executive Summary and Draft Report address anticipated savings and customer satisfaction due to consolidations but no empirical evidence is available to support these claims. It is strongly recommended that data in the form of surveys of customers served by consolidated RPMA activities, as well as cost analyses of these actions to demonstrate the feasibility of savings be conducted and included in the study. Until such data are available, the SAG should not act on the study recommendations.

c. The alternatives studied by the contractor considered the current method of operations and three other centralizing options. There is no indication that any option considering further decentralization was studied. An option giving the installation commander the ability to do all of his planning, designing and operating should also have been reviewed.

d. A study recommendation essentially fragments control of utilities, a high dollar value program, between the installation commander and the [illegible] conclusive justification.

e. Several sections in the Draft Report are still missing from Section V pertaining to policies and procedures used by Housing and Urban Development (HUD) and General Services Administration (GSA). Before decisions can be made or recommendations offered, a full report must be available.

f. Page 38 of the Draft Report makes mention in paragraph 2 of the IFS. The report states that "The IFS concept is valid in the abstract." and "the voluminous reports that are being produced are proving a burden rather than an aid to an already burdened staff." This matter should be examined in depth again utilizing empirical evidence to support such observations.

g. Major command comments relative to data and conclusions contained in the report should be included as an annex to the report. This is customary in GAO and USAAA reports and will give the reviewer the benefit of the commands validation of data and viewpoints from the Army's users of RPMA resources.

h. The revolving fund concept is very sketchy; financial management as well as program management implications need to be fully developed and analyzed.

i. A major issue is how the district engineer will establish workload priorities among the installations. Operational (mission) requirements must be considered as well as program management factors.

j. A major FY 80 OSD issue is a substantial civilian personnel reduction to be offset by contracting out. If this issue becomes fact, maintenance of real property facilities becomes a prime candidate for contracting out. The cause and effect relationship on the near and long term study concepts need to be fully developed.

2. It is hoped that the foregoing comments will assist the SAG in evaluating the study. It is recommended that all comments be considered before any further action is taken in this matter.

FOR THE COMPTROLLER OF THE ARMY:

COREY J. WRIGHT
Brigadier General, GS
Director of Operation
and Maintenance, Army

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY FORCES COMMAND
FORT MCPHERSON, GEORGIA 30330

AFCS 22 August 1978

SUBJECT: Phase II Report of the Real Property Management System (RPMS) Study

HQDA (DAEN-FER)
WASH DC 20314

1. Reference HQDA Memorandum, DAEN-FER, dated 31 July 1978, subject: Study Advisory Group (SAG) Meeting - Real Property Management System (RPMS) Study.

2. The Real Property Management System (RPMS) can be improved within the current organizational structure. The Phase II study recommendations for reorganization are not considered necessary to accomplish improvements. Although the study attributes "greater flexibility to the Army," it places the decision-making and prioritization authority with the Chief of Engineers, HQDA level, which could result in less responsiveness to the unique considerations confronting commanders today.

3. FORSCOM installation commanders already have extensive overall constraints on their funds and manpower that make successful mission performance very difficult. Currently, these commanders have only "coordinative" control over their medical support (MEDDAC-HSC), communications (C&E-USACC), club operations (Club Management Agency - TAGCEN), Post Exchange (AAFES), and commissary (Troop Support Agency). Further compartmentalization of funds and extending BASOPS fund support processing levels will further compound these problems and could result in decreased mission responsiveness at installation and MACOM level.

4. Stovepiping RPMS responsibilities for the short-term at engineer districts and for the long-term with the Chief of Engineers will not necessarily improve engineer resource shortfalls and could result in decreased responsiveness and customer satisfaction. As presently constituted, the engineer districts are not oriented toward facilities engineering (FE) work, nor do they have any significant expertise in this field. District office locations, most of which were originally selected to conform to civil works activities (watershed boundaries), are not necessarily in the best locations to provide installation

support. The realignment of functions and reorganization required to establish adequate district engineer support areas could be extensive and costly. The Phase II study presented no data on current adequacy of district engineer support areas.

5. The Phase II study presents a concept only and does not analyze feasibility, cost, geographical, distance and other factors which have a direct bearing on feasibility of proposals presented. Support of Reserve Components is a major function of installation and Reserve commanders and this has not been identified in the study. Another area not addressed in the report is the engineer support of combat organizations which is different from normal district engineer functions. The study also did not address reaction time by the district engineers in support of FORSCOM missions. Lengthy reaction time will adversely impact upon mobilization capability and force readiness.

6. It is recommended that the Phase II study concept not be implemented and that the existing organizational structure be retained with increased emphasis given to establishment of policies effecting greater support to the installations from district engineers and Office of the Chief of Engineers.

FOR THE COMMANDER:

C. M. HALL
Major General, GS
Chief of Staff

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY TRAINING AND DOCTRINE COMMAND
FORT MONROE, VIRGINIA 23651

ATEN-RM-IE 22 August 1978

SUBJECT: Real Property Management System (RPMS) Study, Phase II Report

Brigadier General Walter O. Bachus
Director of Facilities Engineering
Chief of Engineers
Department of the Army
Washington, D. C. 20314

1. Reference OCE Memo of 31 July 1978, Subject: Study Advisory Group (SAG) Meeting - Real Property Management System (RPMS) Study.

2. HQ TRADOC does not concur with the subject report.

3. The study does not address the real problem associated with Real Property Maintenance Activities (RPMA) that confronts the Army today. The problem is one of overall management of resources for competing missions at the installation level--not one of insuring that a separate RPMA system is optimized to serve itself.

4. The Army Command Management System provides a means for analyzing each installation mission requirements and allocating resources based on those requirements by program area. The recommended concept included in the study report would be much less responsive to mission and customer requirements than the ACMS currently being utilized.

5. Stovepipe systems have increasingly taken management prerogatives and flexibility away from the commanders. We cannot accept another extension of this practice in the Facility Engineer area which will cause a further deterioration in mission responsiveness and defuse management.

6. Comments concerning some of the opinions, assumptions and recommendations contained in the subject report are provided at inclosure 1.

FOR THE COMMANDER:

Robert C. Hixon

ROBERT C. HIXON
Major General, GS
Chief of Staff

1 Incl
as

CONCLUSIONS/RECOMMENDATIONS FROM REPORT	TRADOC COMMENT
1. The revolving fund concept as recommended achieves substantial benefits in resource allocation, technical direction, and cost identification and control. (Page 152, Study Report)	1. It is TRADOC's position that the cost of FE activities will substantially increase as a result of the revolving fund concept. 2. Costs are controlled and identified under the IFS in great detail. The revolving fund concept will not be an improvement over this system. 3. The revolving fund will not improve resource allocation as funds are allocated to the MACOMs thence to the installations in bulk. 4. The purpose of the industrial fund is to generate total cost of operations for producing a product and passing those costs to a customer. Where costs are excessive to industrial operations, the operation or plant is closed. Within TRADOC we have no physical product and even if we did use the IF concept, other factors such as political and Army needs would dictate that we continue operations at all levels.
2. The report indicates that TRADOC has an Engineer design staff of 660 personnel at installations with a potential saving of 30 manpower spaces under the recommended consolidation. (Page 169, Study Report)	1. A review of all installation TDAs indicate that TRADOC has a requirement of only 381 spaces of which 272 are authorized for this function (Engineering Services Branch). The report indicates a District Staff of 630 manpower spaces would be required to service MACOMs upon transfer of these functions from the installation to the DE. This is a net increase of 249 manpower spaces vice a reduction of 30 spaces.

CONCLUSIONS/RECOMMENDATIONS FROM REPORT	TRADOC COMMENT
	2. Most installations' engineering staffs are understrength and currently working overtime. Pooling these assets will not necessarily provide any space saving or produce better management or utilization.
3. The strengths cited for the recommended alternative do not specifically address mission responsiveness. (Page 147, Study Report)	1. The rating factors assigned under this alternative, as well as the other two alternatives considered, indicate a reduction in mission responsiveness from the current command system. (Page 150)
4. "Resource allocation process works too slowly, and fourth quarter efforts to compensate do not really resolve the problem." (Page 7, Executive Summary)	1. TRADOC's contractual process provides the DFE with a yearly program and essentially fulfills its obligation. The fourth quarter additional funding should not be considered as part of that program - it is, in fact, a plus-up to that program and is allocated based on valid needs.
	2. The Subject to Availability Funds (SAF) procedures utilized within TRADOC insures that funds are appropriately allocated in an efficient manner.
5. Study states that BMAR is out of control and growing.	1. Apparently this statement applies only to the European situation. In reality BMAR has always been there, but has now been quantified through IFS. TRADOC's BMAR identification, validation and funding process is improving and BMAR dollar value is decreasing.
6. The present system encourages the accomplishment of short range objectives at each installation. However, there is no assurance that long-term preservation of Army-wide real property assets will be maintained by the present management structure. On the contrary, there is evidence that under the present system the asset base is eroding. (Page 136, Study Report)	1. Do not agree. No evidence was presented in the study report.
	2. The BMAR Program is a long-range plan or projection for preservation of the Army's real property assets.

CONCLUSIONS/RECOMMENDATIONS FROM REPORT	TRADOC COMMENT
7. The recommended system provides for integration of technical guidance and execution of RPMA for more efficient utilization of total engineering resources. (Page 147, Study Report)	1. Do not concur for reasons presented below by function: a. Master Planning - Master Planning cannot be divorced from the installation. Mobilization and contingency planning as well as facility utilization and day to day decisions on M&R and minor new work need to be coordinated with master plans. b. Project Design - M&R project design requires intimate knowledge of the installation. The distance of some support districts would make performance much more costly and considerably less responsive. Further we have had many experiences where engineers who are remote from facility operations tend to neglect maintainability in design and considerable after-the-fact modification or increased operating costs are incurred. Design of M&R projects or facility modifications require continuous dialogue with FE operating division personnel which would be severely hampered by geographic separation. c. Contract Specification Writing - Basically the same comment as design. The functions are inseparable. d. Environmental Impact Studies - Products from COE Districts are expensive, slow and of poor quality. Again intensive knowledge of the installation, local problems and operations is required and can't be done as well from a central point. e. Traffic Engineering - Considerable on-site work is required which dictates FE responsibility and performance.

CONCLUSIONS/RECOMMENDATIONS FROM REPORT

TRADOC COMMENT

f. Preparation of 1391s and PDBs. These documents must represent user needs, be attuned to the installation operations and peculiarities and provide more emphasis to maintainability.

g. Utility Contracting - No benefit is derived from consolidating this function. The many sales contracts can be more effectively negotiated at installation level, since contacts and rapport with local suppliers depend on local conditions.

h. Condition Surveys - District personnel would not have the knowledge of the installation required to perform this function.

i. Warranty Enforcement - COE Districts should accept responsibility for this. No change is needed except to get the Districts to perform as required.

j. BMAR Validation - Currently BMAR is validated throughout the 22 installations by the TRADOC Engineer with one set of standards and rules. BMAR must be validated by the HQ providing the resources.

k. FE Responsibilities - The FE is responsible to the commander for all engineer work on the installation. Removing his engineering and resource management capabilities to a remote location does not free him to concentrate on local issues but increases his frustration and image with his commander by not being able to control or provide up-to-date status on engineering problems.

CONCLUSIONS/RECOMMENDATIONS FROM REPORT

TRADOC COMMENT

1. Priorities - Commanders will be unable to influence the overall priority of work since supporting districts must respond to up to four MACOMs.

2. There are particular pitfalls in the recommended system that have not been adequately addressed. Some of these are:

   a. Functions such as M&R design, specifications, traffic engineering, PBDs, utility contracting (sales mostly) and BMAR validation require intimate knowledge of the installation and considerable on-site work to accomplish. The distance of some support districts would make performance much more costly and considerably less responsive.

   b. Proper design of M&R projects requires continuous dialogue with operating division personnel which would be hampered by geographic separation.

   c. BMAR validation would be much less uniform than currently as performed by MACOMs.

   d. Engineers who are remote from facility operations tend to neglect maintainability in in design.

   e. The FE is responsible to the commander for all engineer work on the installation. Removing his engineering capabilities to a remote location does not free him to concentrate on local issues but increases his frustration and image with his commander by not being able to control or provide up-to-date status on engineering problems.

CONCLUSIONS/RECOMMENDATIONS FROM REPORT	TRADOC COMMENT
	f. With supporting districts responsible to priorities from up to four MACOMs, commanders will be unable to influence the priority of work.
	g. All technical capability will be removed from the installation which will greatly extend reaction times for solving critical engineering problems. The FE will not have capability to even develop scope of work on projects. This will greatly increase cost for developing projects.

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVE., ALEXANDRIA, VA. 22333

DRCIS-EF 30 August 1978

SUBJECT: Study to Improve Real Property Operations and Maintenance in the US Army

HQDA (DAEN-FER)
WASH DC 20314

1. References:

a. Memorandum, DAEN-FER, 31 July 1978, subject: Study Advisory Group (SAG) Meeting - Real Property Management System (RPMS) Study.

b. Message, DAEN-FER-P, DTG 071829Z Aug 78.

2. The draft report on the subject study, forwarded by reference 1a, has been reviewed by this headquarters and by selected major subordinate commands and installations of DARCOM.

3. Mr. Tom Cody (Lester B. Knight and Associates) presented briefings of the study to DARCOM personnel on two occasions, one on 7 August 1978 to working level personnel of HQ, DARCOM and major subordinate commands and installations, and another on 17 August 1978 to representatives of the DARCOM Command Group and selected headquarters staff members.

4. After thorough consideration, several major concerns exist. These concerns are:

a. The study presupposes that our current execution of new construction and maintenance/repair of facilities is so poor as to suggest the need for a stovepipe RPMS at the expense of our current command management system. The study seems to indicate a need to divorce the installation commander partially from the responsibility and totally from the execution of his facilities program.

b. The study is unclear on how the revolving fund would work and interface with the existing revolving fund (AIF) and various appropriations. What controls would the commander have over the district engineer?

c. The additional fenced area of RPMS would reduce an installation commander's ability to balance scarce resources by trade-offs between RPMS and mission.

DRCIS-EF 30 August 1978
SUBJECT: Study to Improve Real Property Operations and Maintenance in the US Army

d. The study gives inadequate consideration of the benefits in the present system which permits the installation commander the option of accomplishment in-house, by district, or by contract.

e. The study adds a layer of supervision (engineer district) to the overhead cost. The installation commander is still responsible for supervision of the program and must retain sufficient staff for discharge of his responsibility.

5. In view of the above comments, DARCOM nonconcurs in the RPMS study in its current form. The issue discussed in the preceding paragraphs must be resolved.

FOR THE COMMANDER:

for ROBERT L. MOORE
Brigadier General, USA
Chief of Staff

L. A. [illegible]
COLONEL, GS
Deputy Chief of Staff

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