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AN EFFECTIVE ORGANIZATION FOR THE DIRECTORATE OF SYSTEMS INTEGRATION

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Executive Summary

AN EFFECTIVE ORGANIZATION FOR THE DIRECTORATE OF SYSTEMS INTEGRATION

The Directorate of Systems Integration (CEHSC-S) is an integral part of the U.S. Army Engineering and Housing Support Center (CEHSC). CEHSC-S is responsible for the development, acquisition, installation, sustainment, training, and customer support for Directorate of Engineering and Housing (DEH) automated information systems worldwide. It has eight organizational components at two locations – Fort Belvoir and Fort Lee in Virginia.

Senior managers in CEHSC-S are concerned that rapid changes in computer technologies, mission requirements, and the DEH environment are straining its ability to provide quality services. A related concern is that its current organizational structure and geographic split are hindering internal operations.

We found that many of the issues facing CEHSC-S, both internal and external, are linked to organizational structure. The current structure hinders effective management in several key areas. Coordination between divisions is difficult, expertise is in narrow functional areas rather than in entire systems, there is little technology exchange between systems, there is no central focus on developing technologies or systems integration, customer support is scattered, and planning efforts are often fragmented or inadequate.

Our analysis suggests that a different organizational concept is appropriate for managing the current and future missions of CEHSC-S. We recommend that CEHSC-S reorganize into three divisions: a Project Management Division, a DEH Systems Support Division, and an Information Resource Management Division. This form is a departure from the current organizational structure in several respects:

- Systems development, design, and deployment activities are centralized for all systems.
- New systems are managed in a project-oriented environment.

- Systems sustainment and customer support activities are centralized for all systems.
- Planning and integration activities are given increased resources and a higher priority.
- Technology transfer activities are centrally coordinated and given increased attention.

While reorganizing CEHSC-S will inevitably create some short-term disruption, such problems can be held to a minimum by proper implementation. We recommend a plan for reorganizing into the proposed structure over a 2-year period. Included in this plan is the proposed consolidation of directorate personnel at a single location (Fort Belvoir). Adopting the plan will provide the basis for substantial improvements in the way CEHSC-S does business, both in the short and long term.

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CONTENTS

	Page
Executive Summary	iii
List of Tables and Figures	vii
Chapter 1. Introduction	1- 1
Chapter 2. Background	2- 1
The Engineering and Housing Support Center	2- 1
Directorate of Systems Integration	2- 2
Chapter 3. Major Issues	3- 1
Integrated Facilities System Mini/Micro	3- 1
Other DEH Systems	3- 3
Management	3- 4
Operations	3- 6
Internal Conflicts	3- 8
Summary	3- 8
Chapter 4. Organizational Analysis	4- 1
The Current Organizational Structure	4- 1
The Product Organization	4- 2
The Life-Cycle Organization	4- 4
The Matrix Organization	4- 5
Summary	4- 6
Chapter 5. Conclusions and Recommendations	5- 1
Proposed Organizational Structure	5- 1
Contingencies and Risks	5- 6
Implementation	5-10
Nonorganizational Recommendations	5-13
Summary	5-15

CONTENTS (Continued)

		Page
Appendix A.	List of Interviews and Contacts	A-1–A-5
Appendix B.	Directorate of Systems Integration Personnel Survey	B-1–B-8
Appendix C.	Directorate of Engineering and Housing Information Systems Survey	C-1–C-6

TABLES

		Page
2-1.	HOMES Support	2- 5
2-2.	System Sustainment and Customer Support Division	2- 6
4-1.	Current CEHSC-S Structure	4- 1
5-1.	Recommended Functions and Responsibilities	5- 7
5-2.	Relationships Between Old and New Organization	5-14

FIGURES

2-1.	Current Organization of CEHSC	2- 2
2-2.	Current Organization of CEHSC-S	2- 4
4-1.	CEHSC-S as a Product Organization	4- 3
4-2.	CEHSC-S as a Life-Cycle Organization	4- 4
4-3.	CEHSC-S as a Matrix Organization	4- 6
5-1.	Proposed CEHSC-S Organization	5- 3
5-2.	Proposed Implementation Time Line	5-14

CHAPTER 1

INTRODUCTION

The Directorate of Systems Integration (CEHSC-S) is an integral part of the U.S. Army Engineering and Housing Support Center (CEHSC). CEHSC-S is responsible for the development, acquisition, installation, sustainment, training, and customer support for Directorate of Engineering and Housing (DEH) automated information systems worldwide. It also manages the Army's database system for real property and housing inventories.

CEHSC-S is currently organized so that some divisions or branches support specific systems or customer areas, while others support specific stages of the systems life cycle. Furthermore, CEHSC-S staff members are located at two Army installations (Fort Belvoir and Fort Lee in Virginia) over 100 miles apart. This organizational structure and the associated geographical split may be hurting the directorate's ability to carry out its mission, particularly now that the new Integrated Facilities System Mini/Micro (IFS-M) is being deployed.

The Logistics Management Institute was asked by CEHSC and CEHSC-S management to recommend an effective organizational structure for the directorate. To support our analysis, we administered questionnaires to directorate personnel, interviewed directorate and other CEHSC personnel, surveyed DEHs at major installations, and visited several installations. In addition to organizational structure, we looked at other relevant factors such as workload, resources, and management.

This report is divided into five chapters. Following this introduction, Chapter 2 provides an overview of CEHSC, CEHSC-S, and DEH automation; Chapter 3 discusses the major issues facing CEHSC-S; Chapter 4 contains an analysis of alternative organizational structures; and Chapter 5 presents our conclusions and recommendations. There are also three appendices: Appendix A lists the people contacted during the study; Appendix B documents the survey of CEHSC-S personnel; and Appendix C documents the survey of installation DEHs.

CHAPTER 2

BACKGROUND

THE ENGINEERING AND HOUSING SUPPORT CENTER

Background

The U.S. Army Engineering and Housing Support Center was established in October 1987. In complying with the DoD Reorganization Act of 1986, the U.S. Army Corps of Engineers decided to combine missions and functions of the Facilities Engineering Support Agency (FESA) and selected divisions of the Office of the Assistant Chief of Engineers into a single organization – USAEHSC, also known as CEHSC. CEHSC has become a major field activity of the Corps of Engineers, providing mobilization planning, long-range planning support, and engineering and technical support for major command (MACOM) engineers and DEHs.

Missions and Functions

CEHSC supports the Chief of Engineers, MACOMs, and DEHs at Army installations worldwide in three major mission areas:

- It helps develop and implement Army policy for facilities engineering and housing programs.
- It provides technical support and guidance to MACOMs and DEHs.
- It maintains prime power capabilities.

Organization

CEHSC's missions are carried out by six functional directorates and offices:

- Directorate of Facilities Engineering
- Army Housing Office
- Utilities Contracts Office
- Directorate of Systems Integration

- Directorate of Prime Power and Emergency Operations
- Directorate of Professional Development and Training.

Figure 2-1 shows the current CEHSC organization.

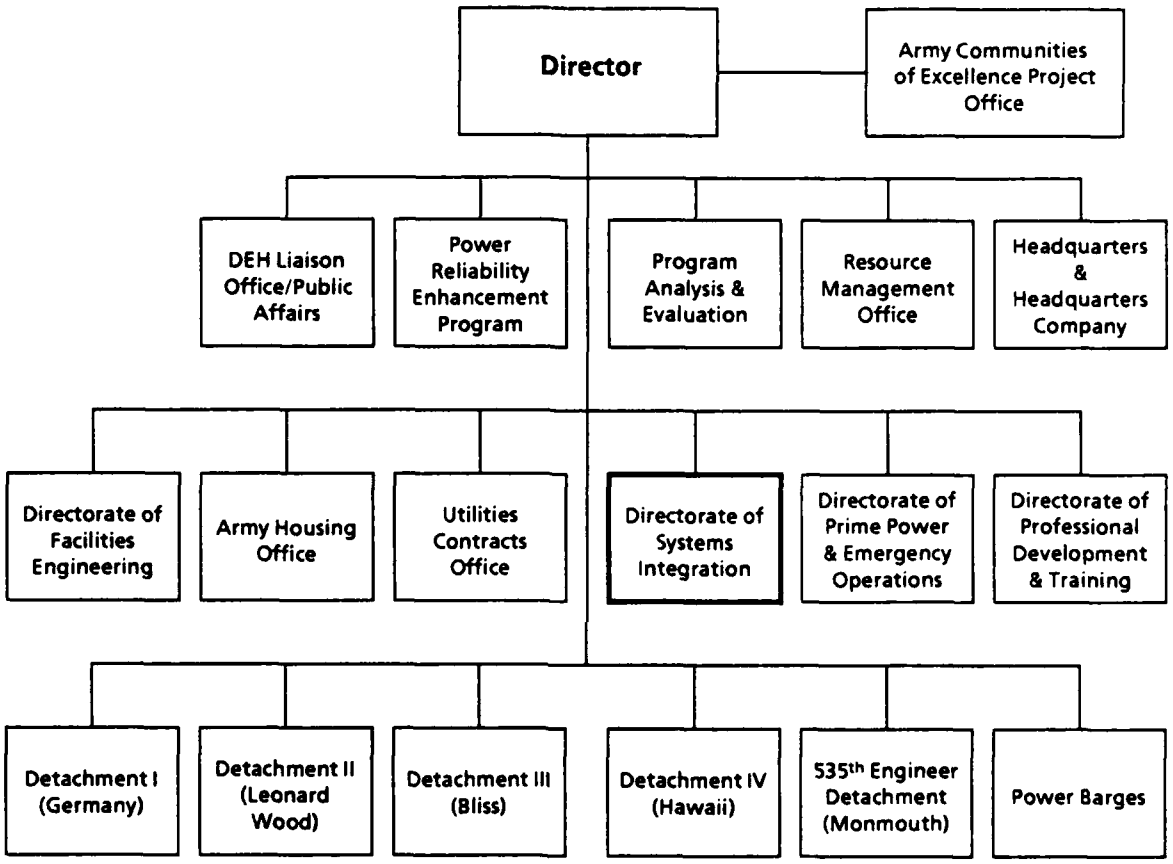


FIG. 2-1. CURRENT ORGANIZATION OF CEHSC

DIRECTORATE OF SYSTEMS INTEGRATION

Background

Before the establishment of CEHSC in 1987, CEHSC-S was part of the FESA organization. In the early 1960s, the directorate was given the mission of being the Army's proponent for managing and integrating DEH automated information systems. The directorate has carried out and expanded these responsibilities with advanced technologies and new systems and has continued this mission as CEHSC-S.

Systems Supported

The major systems supported by CEHSC-S include:

- *Integrated Facilities System I (IFS-I)* – Encompasses life-cycle management of Army real property resources. This system will be replaced by IFS-M at most installations.
- *Headquarters Integrated Facilities System (HQIFS)* – A family of information systems designed to use data collected by IFS-I and other sources for facility reporting requirements.
- *Integrated Facilities System Mini/Micro (IFS-M)* – A replacement of IFS-I that expands on the previous system's functionality and replaces batch processing with fully interactive processing at the DEH level.
- *Facilities Engineering Supply System (FESS)* – An automated inventory and supply system for supporting DEH operations.
- *Facilities Engineering Job Estimating System (FEJE)* – A tri-Service interactive system to aid in planning and estimating facility maintenance work.
- *Integrated Facilities Data Entry Process (IFDEP)* – Provides up-front data entry for the IFS-I system.
- *Housing Operations Management System (HOMES)* – An interactive management system for housing operations, including family housing and termination, housing repairs, furnishings, and financial management.
- *Defense Energy Information System (DEIS)* – Collects and reports energy consumption data to the Department of the Army (DA) and DoD.

Current Organization

CEHSC-S is organized into the Office of the Chief, the Planning and Integration Office, the Office of the Project Manager for IFS-M, the IFS-M Acquisition Office, and three operating divisions. The directorate is split between two locations over 100 miles apart, with the Facility Engineering Support Division and Systems Maintenance Branch being located at Fort Lee and the rest of the organization at Fort Belvoir. Figure 2-2 shows the current organizational structure.

CEHSC-S has an authorized strength of about 60 civilian employees. Its structure and size have changed over the years. It expanded and restructured to meet the needs of new DEH systems such as IFS-M and HOMES and has recently created a

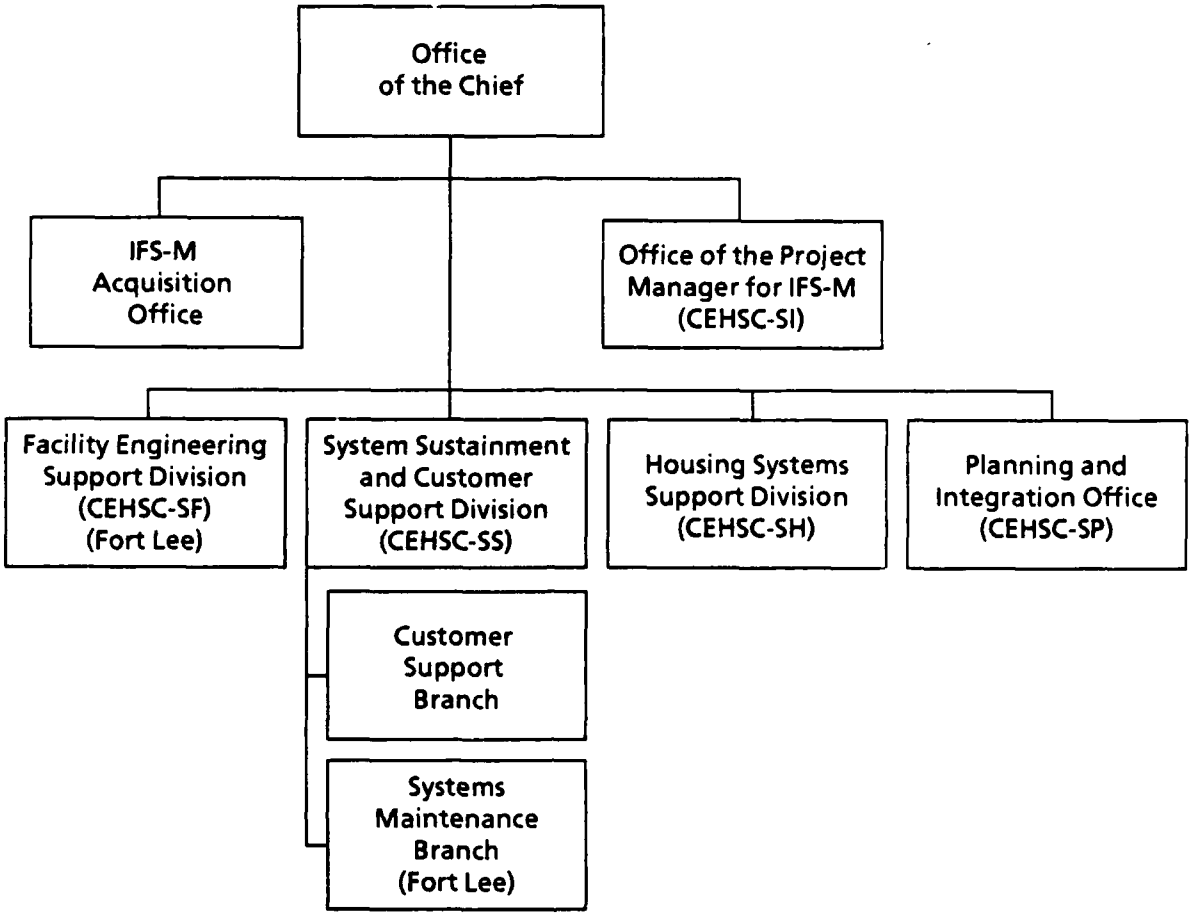


FIG. 2-2. CURRENT ORGANIZATION OF CEHSC-S

Planning and Integration Office to address planning concerns across all DEH systems. The CEHSC-S offices and operating divisions are discussed below.

Facility Engineering Support Division

The Facility Engineering Support Division began as a small project office providing functional expertise on the development and design of IFS-I. First established at Fort Lee in the early 1970s, the office continued its role in IFS-I redesign through 1979. During this time, it expanded its original functions to include customer support and sustainment and systems development efforts for FESS and FEJE. With these expanded workloads and functions, it was established as a division in the late 1970s. Since then, its major role has been development and design of the IFS-M system. A separate branch responsible for customer support and

sustainment of existing facility and engineering systems was created in 1986 and located at Fort Lee.

When IFS-M completed systems testing and approval, the division realigned its manpower into two teams: a Systems Development Team, responsible for continued development and enhancement of the remaining IFS-M functional modules and integration efforts; and a Systems Deployment Team, responsible for overseeing the installation and initial training for IFS-M worldwide. The division currently has about 20 authorized positions.

Housing Systems Support Division

The Housing Systems Support Division is responsible for the development, design, installation, sustainment, and customer support of DEH housing support systems. The division is separated into six teams: one for each of the five HOMES functional modules, with each team responsible for the life-cycle support of that module; plus a single deployment team for all modules. Table 2-1 shows the team responsible for, and the current status of, each HOMES functional module. The division currently has about 20 authorized positions and is also supported by five employees from the Army Engineer Automation Support Activity (CEASA), with one assigned to each team except the deployment team.

TABLE 2-1

HOMES SUPPORT

Team	HOMES module	Current status
Family housing assignment and termination	A&T	Sustainment/support
Housing referral/survey	HR/S	Sustainment/support
Billeting	BIL	Sustainment/support
Furnishings management	FURN	Beginning deployment
Financial management	HFIN	In development
Deployment	All modules	–

System Sustainment and Customer Support Division

The System Sustainment and Customer Support Division is responsible for keeping DEH Facilities Engineering (FE) systems operational, including program enhancements, configuration management, documentation, customer hot lines, problem solving, and training. The division is the only one in CEHSC-S that is split between two locations. The Customer Support Branch and Division Chief are located at Fort Belvoir, while the Systems Maintenance Branch is located at Fort Lee. Both branches are responsible for most aspects of sustainment and customer support but differ in the specific systems and configurations they support. The division currently has about 20 authorized positions. Table 2-2 shows the primary responsibilities of each branch.

TABLE 2-2

SYSTEM SUSTAINMENT AND CUSTOMER SUPPORT DIVISION

Branch	Systems supported
Customer Support Branch (Fort Belvoir)	FEJE – Worldwide IFDEP – (In Europe and on UNISYS platforms) HQIFS – Worldwide
Systems Maintenance Branch (Fort Lee)	FESS – Worldwide IFS-I – Worldwide IFDEP – (On Motorola 4-Phase and INTEL platforms)

Planning and Integration Office

The Planning and Integration Office was established in 1987 (when the directorate became part of CEHSC) with the broad responsibility of focusing on the integration of DEH systems and providing coordination across all systems under CEHSC-S's responsibility. The office is currently staffed with two civilian employees. In its brief history, it has focused more on budgeting issues than on the broader issues of systems integration.

Office of the Project Manager for IFS-M

The Office of the Project Manager for IFS-M was created in 1986 to provide a central project office for oversight and management of systems development, design, acquisition, and deployment of IFS-M as a major Standard Army Management Information System (STAMIS). The project manager's office is currently staffed with two civilian positions.

CHAPTER 3

MAJOR ISSUES

To propose an effective organizational structure for CEHSC-S, we first had to determine what could – and what could not – be effected by organizational change. This required us to look at all the major issues facing the directorate, not just those related to organizational structure. Using information from employee questionnaires, interviews, DEH surveys, and site visits, we identified a number of important issues that we grouped into four categories: IFS-M, other DEH systems, management, and operations. The major issues comprising each of these categories are summarized below.

INTEGRATED FACILITIES SYSTEM MINI/MICRO

Development

Five of the fourteen modules planned for IFS-M have been developed. A key issue facing CEHSC-S is the development of the nine remaining modules and how application development will be accomplished. Opinions differ as to how much work this will entail. In particular, members of the Facility Engineering Systems Support Division (CEHSC-SF), who are responsible for IFS-M development, believe that too few resources and too low a priority are now planned for this task; they also feel that management is underestimating the workload. The main reason for this disagreement over the remaining development is that current development plans partially rely on off-the-shelf software and existing application programs. However, many people believe that poor internal communications and coordination within CEHSC-S are contributing to the perception of this issue as being a problem.

Interfaces

Another IFS-M issue is the need to develop interfaces with other DEH systems. This task is technically complicated by dissimilar data dictionaries, different hardware environments, and changes to the systems being interfaced. These technical obstacles are in the process of being overcome. This task is further

complicated by the directorate's current organizational structure, as it involves people from multiple branches and locations within CEHSC-S.

Deployment

A third IFS-M issue is the deployment of the five modules that now make up IFS-M. People both inside and outside CEHSC-S are concerned that the IFS-M deployment plans may be overly ambitious or optimistic. Previous deployment experiences, the size and complexity of IFS-M, and the heavy reliance on contractors were cited as the reasons for concern. However, such concerns tend to be common with any large-scale systems deployment and do not preclude success.

Staff members in CEHSC-SF are currently responsible for IFS-M development and deployment. They feel this dual mission will make it hard for them to devote any additional resources to deployment without adversely affecting development. Conversely, any problems experienced with development could have a negative effect on deployment.

The DEHs have three other deployment-related concerns. First, they suspect that the actual deployment process will take longer than planned, particularly where extensive data file transfers are required. Second, they are worried that the deployment training may not be adequate (and that sustainment training may not be available). Third, they want to retain the word processing and other special applications currently available on the system.

Sustainment

The final IFS-M issue of immediate importance is the sustainment of the five existing modules once they have been deployed (while continuing to support existing DEH systems). Given the size, complexity, and multifunctionality of IFS-M, its sustainment requirements (including technical assistance, training, and customer support) are likely to be substantial. It is therefore of serious concern to people both inside and outside CEHSC-S that nobody currently has the clear mission or the necessary resources to perform IFS-M sustainment.

The Systems Maintenance Branch (Fort Lee) of the System Sustainment and Customer Support Division (CEHSC-SS) believes that it has this mission since it currently supports IFS-I and several other FE systems. This belief has been reinforced by the directorate chief's recent partial reorganization proposal. However,

the branch has very little IFS-M expertise and has not been given the opportunity to gain such expertise. Meanwhile, CEHSC-SF believes that it will ultimately have this mission given its significant IFS-M expertise and its ongoing role in IFS-M development and deployment.

Three other factors further complicate the IFS-M sustainment issue. First, neither CEHSC-SS nor CEHSC-SF has so far received any additional resources for this new task, nor do they expect that their workload will decrease enough to free up sufficient resources internally. Second, the System Development Center at Fort Lee (SDC-L) is responsible for maintaining the software for a STAMIS such as IFS-M. Third, the extent to which contractors – who run hot lines and help sustain other DEH systems – will be involved has not been determined.

The DEHs are very concerned that the IFS-M sustainment mission is still up in the air even though deployment has already begun. Some DEHs believe that requiring installations to provide their own IFS-M hardware maintenance is a mistake and that this responsibility should instead be given to the MACOMs or CEHSC. They are also worried that they may not have enough people or the right types of people to operate IFS-M properly.

OTHER DEH SYSTEMS

Housing Operations Management System

The second largest DEH system is HOMES, which is supported by the Housing Systems Support Division (CEHSC-SH) at Fort Belvoir. By having the development, deployment, and sustainment functions all within one directorate (helped by significant contractor support), CEHSC-SH has been able to resolve or avoid many of the issues noted above. However, we identified at least three issues specifically relating to HOMES. First, the system has proponents both inside and outside CEHSC, a situation that generates conflicting priorities and demands. Second, although most people agree that IFS-M and HOMES will have to interface in some way, these two important DEH systems continue to be designed independently and to run on different hardware. Third, CEHSC-SH (like CEHSC-S) is an organization with both life-cycle-oriented and system-oriented components, and it has similar difficulties in managing internal activities and resources.

Facilities Engineering

The sustainment of FE systems other than IFS-M is another major issue facing CEHSC-S. FESS will still be in use even after IFS-M is deployed, and the change in hardware from IFS-I to IFS-M may increase the support needed by FESS users. The deployment of the first five IFS-M modules will not be complete for at least 2 years, so the sustainment of the FE systems being replaced by IFS-M (IFDEP, FEJE, and IFS-I) will have to continue at close to the current levels during this time, and at reduced levels afterward (since some DEHs will not receive IFS-M). Additionally, other systems – primarily microcomputer-based applications – will be developed for installations not receiving IFS-M. These systems will also require sustainment. However, some CEHSC-SS staff have been reassigned to IFS-M development and deployment, reducing the resources available to support and/or make needed improvements to these other FE systems.

MANAGEMENT

Planning

We also identified a number of broader management issues. One such issue is planning. CEHSC-S was criticized for not doing enough planning (short-term or long-term), for not doing a good job making plans, and for not following through with them. Some managers stressed the point that planning is less of a problem than the perception created by poorly communicated and/or poorly executed plans. Many people believe that these problems result in a tendency by CEHSC-S to make promises (dates, accomplishments, etc.) that it cannot keep, undermining the directorate's credibility and image.

In the directorate's defense, it must be noted that CEHSC-S serves different constituencies with different (and sometimes conflicting) needs and priorities. Detailed plans exist for such major efforts as IFS-M. In addition, short-term problems with existing systems can have a major impact on the affected DEHs and therefore tend to require the directorate's immediate attention, sometimes at the expense of longer term goals and activities, including planning.

However, this does not fully explain the criticism. CEHSC-S does not seem to have a long-term plan to be diverted from. It is widely perceived as being too quick to change priorities. There is a sense that short-term problems are often given too much

importance, involving personnel who should be allowed to continue performing their primary missions. Some of the criticism also seems to stem from the directorate's organizational structure, since the responsibility for "fighting fires" often involves more than one branch, and since very few resources are specifically devoted to planning.

Systems Integration

Another management issue facing CEHSC-S is systems integration. Many people inside and outside the directorate are concerned that DEH systems have different data element definitions and operate under different hardware environments. These differences make it hard for the DEHs to access multiple systems or to exchange information between systems, even with the existence of various interfaces. In fact, it was suggested that CEHSC-S publish a document describing which hardware and software to use for which purpose.

The lack of DEH systems integration is partly due to these systems having been developed at different times for different purposes by different groups. In addition, the various hardware environments for DEH systems largely reflect the advantages of utilizing standard Army equipment buys rather than the needs or characteristics of the systems themselves. However, very few resources have been devoted to this activity by CEHSC-S, since its Planning and Integration Office (CEHSC-SP) has been given other assignments and has undergone some personnel changes.

New Technologies and Techniques

The other major management issue facing CEHSC-S concerns new technologies and techniques. People both inside and outside the directorate felt that CEHSC-S should do more to promote and facilitate the use of new technologies, both among the DEHs and within CEHSC. These technologies include personal computer hardware and software, electronic data transfer, networking, fiber optics, and bar coding.

Many DEHs also want CEHSC-S to collect and disseminate information on new techniques so that they can learn more about what other DEHs are doing. To this end, many people feel that CEHSC-S should improve its understanding of the field by obtaining more firsthand exposure to, and soliciting more input from, the DEHs and MACOMs. As with systems integration, few resources have so far been devoted to this activity by CEHSC-S.

OPERATIONS

Contracting

The final class of issues facing CEHSC-S that we identified in our study concerns the directorate's operations. One such issue is contracting. CEHSC-S employs a number of different contractors to help with the development, deployment, and sustainment of various DEH systems. Many people are concerned that CEHSC-S is becoming too dependent upon these contractors for technical expertise and too vulnerable to delays or other contractual problems.

Meanwhile, CEHSC-S staff see their contract management responsibilities increasing without any corresponding increase in resources or decrease in other workload. At the same time, CEHSC-S is unhappy with the contract support provided by the Humphrey Engineering Center Support Agency and is making increased use of other contracting authorities, despite having to pay an additional fee. To reduce these internal and external problems, directorate personnel believe that a position should be created at the headquarters level to coordinate and facilitate their contracting efforts.

Engineer Automation Support Activity

A second operational issue concerns the Engineering and Housing Systems Division of the U.S. Army Engineer Automation Support Activity (CEASA-DC-E), which provides technical support for DEH information systems. Its personnel are located at Fort Belvoir, where they work closely with CEHSC-S management and staff. However, CEASA-DC-E is dependent upon CEASA headquarters in Washington for many management and administrative functions.

Because of this dual reporting relationship, and because of their physical separation, CEASA-DC-E staff believe that they do not get the attention, resources, or credit from CEASA that they deserve. At the same time, CEHSC-S managers do not have full control over CEASA-DC-E staff, although these people play key roles in the directorate's everyday activities.

Geography

Another important issue relating to the internal operations of CEHSC-S is geography. As noted earlier, part of the directorate is at Fort Belvoir and part at

Fort Lee. For those people who must make frequent trips between these two locations, the driving time (2 – 3 hours each way) significantly reduces the amount of time that they can productively devote to their jobs. In addition, the split has made communications, coordination, and control much more difficult (as has the poor telephone system at Fort Lee). CEHSC and CEHSC-S managers therefore believe that all CEHSC-S personnel should be in the same geographical area and have been trying for several years to achieve this objective.

There are three reasons why geographical consolidation has not yet occurred and why it would still be difficult. The first is the logistics of having to move over 20 people and/or their jobs. Obtaining relocation funds has been difficult; obtaining additional Fort Belvoir office space has been even more difficult; and coming up with both money and space at the same time has been almost impossible.

The second reason is that closing down (or even radically scaling back) operations at Fort Lee could significantly reduce output and productivity for the two groups in particular and for CEHSC-S as a whole. Both of the groups currently at Fort Lee have important missions. They also benefit from being close to SDC-L, the Logistics Center, and key contractors.

The third reason is that the people at Fort Lee do not want to relocate. They enjoy their current working relationships; they have strong ties to the Fort Lee area; and (since they would remain in the same job grades) they do not want to have their standards of living reduced by moving to a higher cost area such as Fort Belvoir.

Manpower

The last operational issue is the directorate's lack of flexibility in the manpower area. CEHSC-S has not been able to convert its temporary (full time) employees to permanent status because of authorized strength limits, reducing the benefits and opportunities available to those employees and making it harder to keep or replace them. In addition, CEHSC-S has both systems- and applications-oriented staff who are not interchangeable, making it hard to reallocate human resources in response to changing mission requirements. The geographical split also limits the directorate's ability to move people between systems or stages, as does the lack of cross-training and integration. Meanwhile, the relatively high grade structure limits internal advancement opportunities. Finally, although total CEHSC-S manpower levels appear to be reasonable, the lack of flexibility has resulted in minimal staffing for the

sustainment of systems being replaced by IFS-M and no staffing for the sustainment of IFS-M.

INTERNAL CONFLICTS

In addition, internal conflicts are rapidly becoming a critical issue facing CEHSC-S. In particular, because of the career histories and the different operational styles of the people involved, poor relationships exist among many of the directorate's management personnel. These poor relationships are currently hurting morale, and may also be hurting productivity as normal lines of communication and authority are either omitted or bypassed. The threat of relocation, uncertainty about IFS-M sustainment, inadequate planning, and many of the other issues cited in this chapter have added to (and have been exacerbated by) these internal conflicts.

SUMMARY

The external and internal issues facing CEHSC-S have become intertwined, with each making the other worse. Organizational change, although not sufficient by itself, is needed to help the directorate effectively accomplish its current and future missions. In Chapter 4, we analyze the advantages and disadvantages of several alternative organizational structures. Chapter 5 then presents our conclusions regarding an effective organizational structure for CEHSC-S, the reasoning behind these conclusions, and our recommendations for implementing any changes.

CHAPTER 4

ORGANIZATIONAL ANALYSIS

This chapter provides an analysis of alternative organizational structures for CEHSC-S. First, we discuss the current structure, citing its advantages and disadvantages. Next, we describe three organizational alternatives and compare the advantages and disadvantages of each for CEHSC-S.

THE CURRENT ORGANIZATIONAL STRUCTURE

The organizational structure of CEHSC-S has evolved over time from one divided purely by customer area (Facilities and Engineering, Housing) to one divided not only by customer area, but also by life-cycle tasks and management tasks, as shown in Table 4-1.

TABLE 4-1

CURRENT CEHSC-S STRUCTURE

Organizational group	Focus	
Facility Engineering Support Division	Primary: Secondary:	Product/System Life Cycle
Housing Systems Support Division	Primary: Secondary:	Product/System Life Cycle
System Sustainment and Customer Support Division	Primary: Secondary:	Life Cycle Product/System
Planning and Integration Office	Primary:	Life Cycle
Office of the Program Manager for IFS-M	Primary:	Product/System

While adaptive changes have allowed CEHSC-S to meet near-term requirements, the environment for providing information systems management has been rapidly changing in several key respects:

- An increased need for systems integration
- An increased use of automation by DEHs

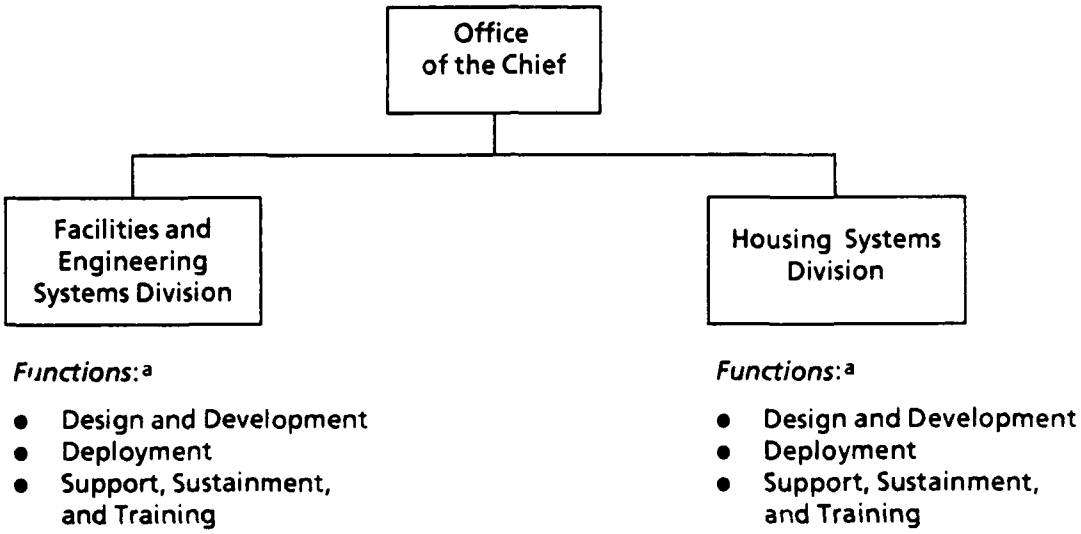
- Rapidly changing technologies and system capabilities
- Increasingly constrained resources.

We believe that the major advantages and disadvantages of keeping the current organizational structure are as follows:

- Advantages:
  - Familiarity.
  - Rapid reaction time within each system group.
  - No cost for implementation.
  - No mission disruption.
- Disadvantages:
  - Minimal opportunities for training personnel in multiple systems.
  - Some duplication of effort and resources.
  - Poor coordination and communication between groups.
  - Expertise is focused on narrow functions rather than on entire systems.
  - Little opportunity for technical interchange between systems.
  - Inefficient transition from one life-cycle phase to the next.

THE PRODUCT ORGANIZATION

As noted above, the division of groups within CEHSC-S has historically been based on product or system areas (Facilities and Engineering, Housing). Before the creation of the CEHSC-SS, CEHSC-SP, and Office of the Program Manager for IFS-M, CEHSC-S essentially had the form of a pure product organization. Figure 4-1 shows how CEHSC-S could be restructured along product lines.



[a] Each division is responsible for supporting a specific systems area – either Facilities and Engineering or Housing – during all phases of the systems' life cycle.

FIG. 4-1. CEHSC-S AS A PRODUCT ORGANIZATION

As a pure product organization, CEHSC-S would group together activities and personnel on the basis of the product or system provided to its customers. A major advantage of the product organization is that it would enable CEHSC-S to concentrate specialized skills in a specific area. A major disadvantage is the cost of lost efficiency and duplication of effort between divisions. Additional advantages and disadvantages of the pure product organization are summarized below.

- Advantages:
  - Strong coordination between life cycle functions within each group
  - Rapid reaction time to problems within each group
  - A strong sense of ownership for each system
- Disadvantages:
  - Minimal opportunity for cross-training or professional development
  - Difficulty of coordination between systems groups
  - Minimal opportunity for technology exchange between systems.

THE LIFE-CYCLE ORGANIZATION

As a pure life-cycle organization, CEHSC-S would group together activities on the basis of the typical system's life cycle. This structure would divide the organization into separate divisions for system design and development, acquisition and deployment, and sustainment and support. Figure 4-2 shows how CEHSC-S could be restructured as a pure life-cycle organization.

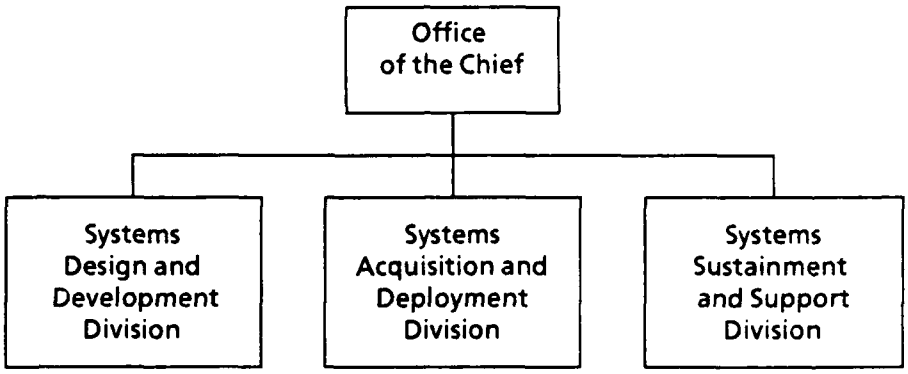


FIG. 4-2. CEHSC-S AS A LIFE-CYCLE ORGANIZATION

Under this arrangement, each division maintains technical expertise for the work to be performed in a particular phase of the system's life cycle. For example, the Systems Acquisition and Deployment Division would have technical expertise in all areas of information systems procurement and could apply this knowledge to all systems in this phase of the life cycle. All systems would eventually pass through each division at some point in their life cycle.

The major advantage of the life-cycle organization is that responsibilities are well defined. The major disadvantage is that there is no clear focus for the complete system. Additional advantages and disadvantages of the pure life-cycle organization are summarized below.

- Advantages:
  - Technical skills are concentrated in each phase of the life cycle.
  - Efficiencies arise from using resources on more than one project at a time.

- All systems benefit from technology transfer.
- Duplication of effort is reduced.

- Disadvantages:
  - Coordination between divisions is difficult.
  - A sense of ownership for any one system is decreased.
  - Staffing is vulnerable to fluctuations in workload.

THE MATRIX ORGANIZATION

The matrix structure is typically most effective when applied to project-driven organizations. Under this structure, project managers would be given responsibility for specific systems over their full life cycles while division managers would be given responsibility for specific life-cycle stages. To be effective, the project managers would be organizationally separated from the life-cycle division managers.

Figure 4-3 shows how CEHSC-S could be restructured as a simple matrix organization. In many ways, the matrix organization is able to combine some advantages and avoid some disadvantages of the other organizational alternatives. The major advantage of a matrix organization is that it provides strong coordination between all divisions involved with systems design, development, and deployment. The major disadvantage is that this coordination can be complex. Additional advantages and disadvantages of the matrix structure are summarized below.

- Advantages:
  - Focus on the entire system.
  - Cost efficiencies of the life-cycle structure can still be captured.
  - Technologies are easily transferred between projects and systems.

- Disadvantages:
  - Conflicts between projects require more management.
  - Ability for fast response to problems is decreased.
  - Moving resources between projects becomes difficult.

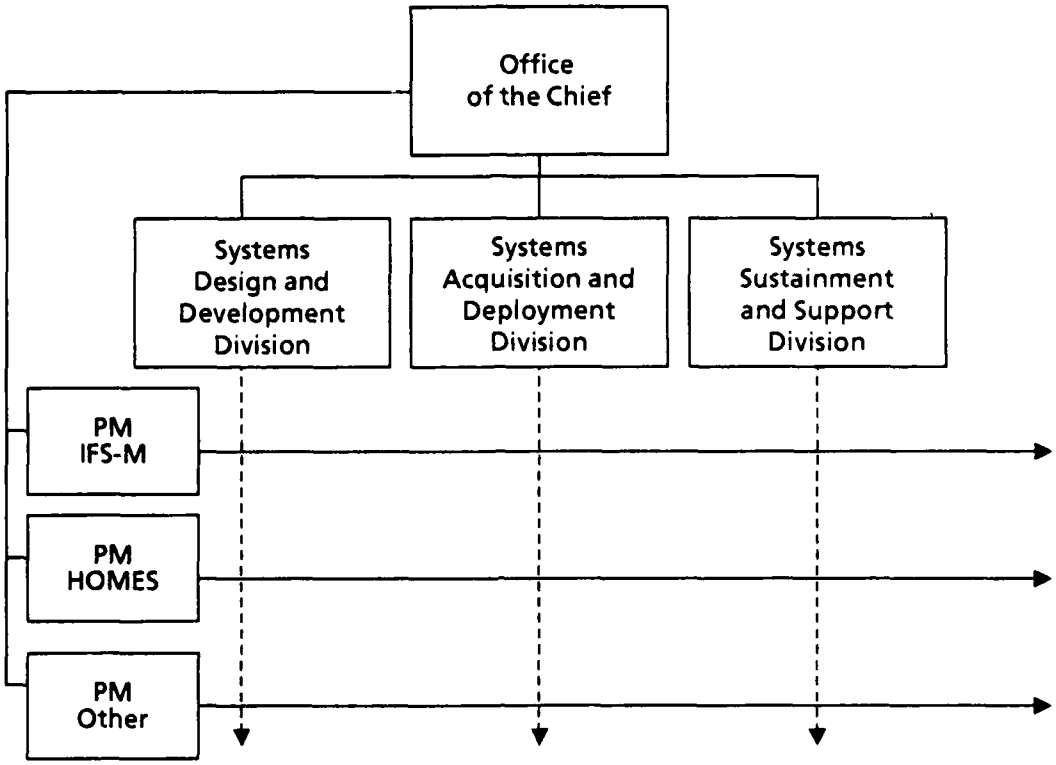


FIG. 4-3. CEHSC-S AS A MATRIX ORGANIZATION

SUMMARY

CEHSC-S must respond to the environment and to customer needs if it is to continue to perform its missions effectively. The increased need for systems integration requires a sharing of expertise across functional boundaries. The increased use of automation by DEHs requires customer support to a wider variety of systems and users. The faster pace of technology change, combined with increasing constraints on resources, will put more pressure on CEHSC-S to capture efficiencies in all phases of the life cycle for each of the DEH systems that it supports.

The impact of such changes has reached the point where they will soon exceed the current organizational structure's capacity to manage and control them effectively. Reorganizing into a pure product or life-cycle structure would not provide the most effective solution. Yet the pure matrix structure, while it is able to combine some of the best features of the product and life-cycle structures, is inappropriate for CEHSC-S. Our analysis therefore suggests that a combination or hybrid structure is best for CEHSC-S: in other words, an organization structured along matrix lines, but

essentially modified to fit the characteristics and missions of CEHSC-S. Chapter 5 presents a detailed discussion of this proposed organizational form for CEHSC-S.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

PROPOSED ORGANIZATIONAL STRUCTURE

We believe that a modified matrix would be the most effective organizational structure for CEHSC-S since it would capture most of the advantages of the three pure forms discussed in Chapter 4 while avoiding most of their disadvantages. The specific characteristics of this modified matrix organization were dictated by the following objectives:

- Provide for improved planning, coordination, and integration
- Capture the efficiencies associated with specific life-cycle stages
- Retain the expertise associated with specific DEH information systems
- Recognize the differences between FE and Housing systems
- Allow for better management of systems development activities
- Clarify responsibilities and provide resources for systems support.

We concluded that the new CEHSC-S organization should have two major divisions with life-cycle-oriented responsibilities – a *Project Management Division* for systems design, development, testing, and deployment; and a *DEH Systems Support Division* for system sustainment, customer support, and training. Each of these divisions would have two product-oriented branches – a *Housing Support Systems Branch* and a *Facility and Engineering Systems Branch.*

We also concluded that there should be a third division that is neither life-cycle- nor product-oriented. An *Information Resource Management Division* is included in the new CEHSC-S organization for planning, integration, budgeting, contracting, technology, and other information/resource management activities.

This new organization differs from the current structure in several key respects:

- The functions of systems development, design, and deployment for all systems come under the authority of a single division.
- New systems development, including major enhancements, would be managed in a project-driven environment.
- Systems sustainment and customer support for all systems come under the authority of a single division.
- Strategic planning, budgeting, and resource management responsibilities are centralized.

Furthermore, it is superior to the current organization in a number of important ways:

- Clearer definitions of the responsibilities for all aspects of IFS-M and future systems
- Greater attention and resources devoted to planning and systems integration
- Increased opportunities for professional development and cross-training
- Improved communication, coordination, and control for management
- Retention of functional expertise throughout the system life cycle
- More flexibility in allocating (and reallocating) resources.

This modified matrix also avoids the major disadvantages of the three alternatives discussed in Chapter 4: the inefficiencies associated with a pure product organization, the coordination problems associated with a pure life-cycle organization, and the management difficulties associated with a typical matrix organization.

The proposed CEHSC-S organization is depicted in Figure 5-1. Its specific characteristics are discussed below. This chapter also includes recommendations for implementing the new organization, along with a brief analysis of contingencies and risks.

Project Management Division

The Project Management (PM) Division would be responsible for the design, development, testing, and deployment of new DEH systems, including major systems enhancements. To be effective, the division should be resourced and managed in a

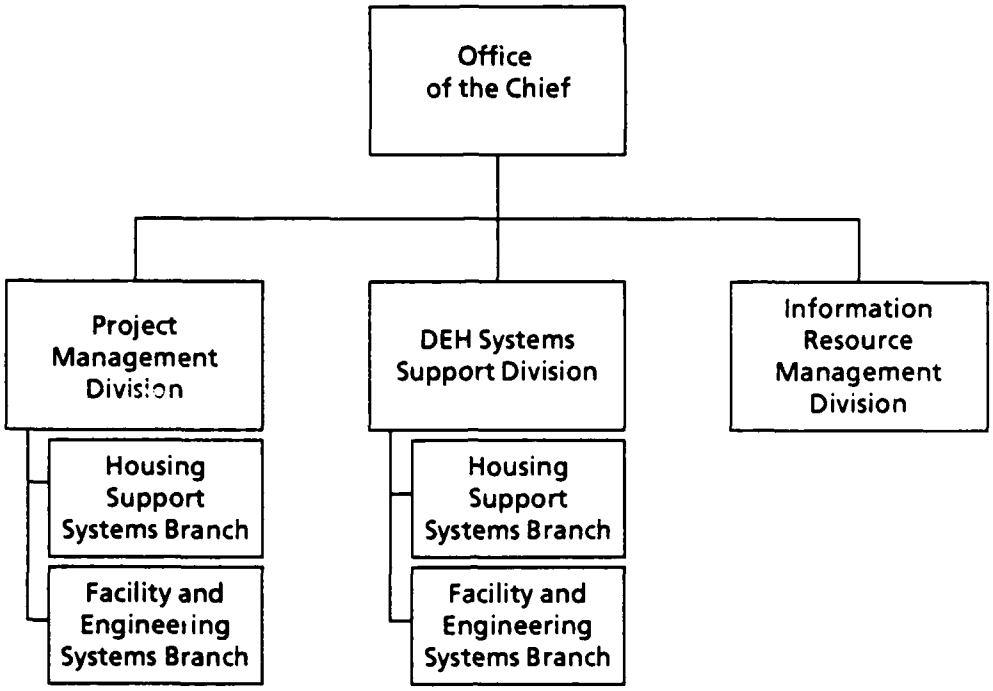


FIG. 5-1. PROPOSED CEHSC-S ORGANIZATION

project-driven environment. The emphasis should be on project execution, not long-term systems support.

Ideally, the PM Division would not have a large fixed staff but would instead have personnel resources assigned or transferred from other divisions, primarily the DEH Systems Support Division. Staff would be assigned/transferred to the PM Division for specific projects but would return to the organization they came from when projects were completed. This offers the advantage of effectively staffing projects while at the same time avoiding the inefficiencies of formally moving staff between divisions. However, detailed agreements among all affected parties will be needed to ensure that the PM Division has full control of the necessary resources for a specified period. In addition, it may be necessary to assign more permanent staff to the PM Division in order to justify the number and level of management slots that such a key division would require.

Given the ongoing efforts in this area, a suggested structure would be to create two subordinate project branches: Facility and Engineering Systems (currently focusing on IFS-M), and Housing Support Systems (currently focusing on HOMES). The PM Division itself should be staffed with a Director of PM overseeing the

execution of all projects, along with full-time project managers assigned to each branch, a budget analyst, a contract specialist, plus a small number of acquisition specialists and other technical staff. This internal structure could be readily modified to support future projects.

DEH Systems Support Division

The DEH Systems Support Division would be responsible for supporting existing DEH systems, including customer support, systems sustainment (maintenance), configuration management, training, documentation, and minor systems enhancements not assigned as projects to the PM Division. The focus of this division should be on supporting existing systems as opposed to systems development.

Sustainment and other support activities will have to be operative as soon as a new system is installed at the first site. The DEH Systems Support Division must therefore become involved in a new system from the beginning of the deployment phase. The transition of responsibilities would occur throughout the deployment phase, with PM Division Staff gradually being assigned/transferred (back) to the DEH Systems Support Division.

The DEH Systems Support Division would maintain the largest fixed staff in the directorate, particularly if it is used as a personnel base for the PM Division described above. Interfaces involving existing systems would be the responsibility of this division, working as needed with the PM Division where new systems or major efforts are involved.

The division should be internally structured to support the two major systems areas: Facility and Engineering and Housing Support. Further splits are not recommended since they may tend to fragment support and hinder integration efforts. The division should be staffed with a director, along with branch chiefs in charge of each system's area. CEASA-DC-E personnel would also become part of this division with their specific assignments determined by their areas of expertise. The division should also include a contract specialist of its own since the types of contracts will be different from those managed by the PM Division.

Information Resource Management Division

Under the recommended organization, CEHSC-S would create an Information Resource Management (IRM) Division with the broad responsibility of coordinating

management activities within the directorate. The primary focus of the IRM Division would include the following responsibilities:

- Coordinating the budgeting and planning for new systems development efforts
- Coordinating shorter range systems development and enhancement efforts in the concept development stages
- Developing, updating, and maintaining plans and goals throughout the directorate
- Reviewing new systems technologies and applications and their potential benefits for DEH systems and coordinate concept plans throughout the directorate
- Providing a central focus for evaluating DEH systems and support requirements
- Monitoring and coordinating contracts throughout the directorate
- Developing and monitoring the directorate's budget, including the management of personnel and resource assignments
- Promoting systems integration efforts.

The creation of the IRM Division would imply changes in how certain tasks and missions within CEHSC-S are managed without implying significant changes in the tasks and missions themselves. The IRM Division would provide a central focus for managing systems integration efforts; it would provide a strong impetus for short- and long-range planning; and it would place emphasis on efficient use of resources.

Office of the Chief

The Office of the Chief would continue to oversee all CEHSC-S activities. The directors of the three divisions would report to, and receive orders from, this office, while the branch managers would report to, and receive orders from, their respective division directors. The Office of the Chief would get involved in specific resource allocation decisions or other day-to-day problems only when such matters could not be resolved by the affected division(s). Finally, the Office of the Chief would be expanded to include a small professional staff that would centralize administrative functions, e.g., property management, logistics, etc.

Summary

The recommended major functions and responsibilities for each element in the proposed new CEHSC-S organization are summarized in Table 5-1.

CONTINGENCIES AND RISKS

Geography

To allay fears of CEHSC-S personnel that the geography issue was driving the reorganization process, we made sure that our recommended geographical structure was determined by our recommended organizational structure (and not vice versa). We also recognize the costs associated with relocation, the directorate's desire to retain good people, and the benefits derived from having Fort Lee personnel close to SDC-L and the Logistics Center (see below). We nevertheless concluded that both of the groups currently at Fort Lee should be moved to Fort Belvoir.

The two pieces of CEHSC-SS will become the new FE Systems Branch of the DEH Systems Support Division and clearly should be combined at one location for greater coordination, control, and efficiency. In addition, the two new FE Systems Branches will need to be at the same location to allow for the necessary movement of personnel between the PM Division and the DEH Systems Support Division.

Although these two conditions can be met by moving the portion of CEHSC-SS that is currently at Fort Belvoir to Fort Lee, such an arrangement would have two serious drawbacks. First, both the PM and DEH Systems Support Divisions would be split between Fort Belvoir and Fort Lee (since the Housing Systems Branches would remain at Fort Belvoir), making the two division chiefs' jobs much more difficult. Second, systems integration efforts would be hampered by having housing and FE systems physically separated as well as organizationally separated.

In particular, the Systems Maintenance Branch (CEHSC-SS) should be moved in order to:

- Improve coordination within the Facility and Engineering Systems Branch of the new DEH Systems Support Division
- Improve overall coordination within this new division

TABLE 5-1

RECOMMENDED FUNCTIONS AND RESPONSIBILITIES

Organizational element	Major functions and responsibilities
Office of the Chief	Overall directorate management Human resource management Administration Interaction with CEHSC, U.S. Army Corps of Engineers, and DA
Project Management Division:	
Division Chief's Office	Division-level resource management Management of project-specific contracts Transfer of personnel to and from DEH Systems Support Division Coordination with Army and DoD development activities
FE Systems Branch	Design of new FE systems Development of new FE systems Testing of new FE systems Deployment of new FE systems (includes acquisition, installation, and training) Major FE system changes/enhancements
Housing Support Systems Branch	Design of new housing systems Development of new housing systems Testing of new housing systems Deployment of new housing systems (includes acquisition, installation, and training) Major housing system changes/enhancements
DEH Systems Support Division:	
Division Chief's Office	Division-level resource management Management of system-specific contracts Transfer of personnel to and from Project Management Division
FE Systems Branch	Customer support for existing FE systems (includes hot lines, sustainment training, documentation, and technical assistance) Configuration management and maintenance of existing FE systems Minor FE system changes/enhancements
Housing Support Systems Branch	Customer support for existing housing systems (includes hot lines, sustainment training, documentation, and technical assistance) Configuration management and maintenance of existing housing systems Minor housing system changes/enhancements
Information Resource Management Division	Directorate-level resource management Contract coordination and oversight Evaluating new technologies and techniques Establishing plans and goals Monitoring progress and accomplishments Promotion of systems integration Requirements analysis and concept development

- Improve the ability of CEHSC-S to (re)allocate human resources
- Create opportunities for cross-training and professional development.

Similarly, the CEHSC-SF should be moved in order to:

- Improve coordination within the Facility and Engineering Systems Branch of the new PM Division
- Improve overall coordination within this new division
- Improve the ability of CEHSC-S to (re)allocate human resources
- Create opportunities for cross-training and professional development.

The Systems Maintenance Branch should be moved as soon as the necessary arrangements can be made. Deferring this move would reduce benefits without significantly reducing its costs. In addition, recent turnover within this branch has left critical positions unfilled, and it would be counterproductive (and difficult) to hire new personnel at Fort Lee if these functions are going to be moved to Fort Belvoir. The Facility Engineering Support Division, on the other hand, should not be moved immediately because of the potential adverse impact on IFS-M. Specific recommendations concerning these moves are presented in our implementation plan later in this chapter.

Turnover

The biggest risk associated with implementing this new organization is turnover. As noted in Chapter 3, the Fort Lee personnel do not want to relocate. Given a choice between moving (along with their jobs) to Fort Belvoir or losing those jobs, some would reluctantly move while others would leave CEHSC-S. The loss of too many key people, especially within a short time, could severely hurt the directorate's ability to carry out its mission. This risk, along with space and funding constraints, has prevented large-scale moves from happening in the past, although individual jobs that become vacant at Fort Lee are currently being filled at Fort Belvoir.

Uncertainty about relocation plans, beliefs that selfish rather than unselfish motives are behind these plans, and perceptions of being punished (by having to move or leave) instead of rewarded for good work have upset Fort Lee personnel, adding to the directorate's problems. These people have valuable experience and expertise; they work well together; they have excellent performance records; and they have

important jobs. Losing them would certainly be unfortunate, and CEHSC-S management should do whatever it can to minimize this loss.

On balance, we believe that turnover costs and risks can be reduced by proper implementation to the point where they are outweighed by the new organization's overall benefits. In addition, since the factors underlying the Fort Lee group's reluctance to relocate will not change in the foreseeable future, giving excessive importance to this issue will lock CEHSC-S into its current unsatisfactory arrangement indefinitely. Furthermore, as noted above, turnover is already occurring at Fort Lee (and would continue to occur if no relocation was made).

Logistics

Regardless of how many personnel move from Fort Lee to Fort Belvoir, CEHSC-S will need additional office space and other resources (computers, telephones, administrative support, etc.) for those functions currently performed at Fort Lee, plus those functions given added emphasis in the new organization. It will also be necessary to transfer or make other arrangements for all contractor operations (hot lines, etc.) currently at Fort Lee.

To avoid problems encountered in the past, CEHSC-S management should simultaneously pursue several alternatives for additional office space. Three location-type options should be investigated: Fort Belvoir (including, but not limited to, the Humphrey Engineering Center); other Army facilities (such as the Pulaski Building or the Pentagon); and leased commercial space. CEHSC-S management should also look at two size options: enough for about 30 new positions and enough for about 60 positions (so the whole directorate could be located in one place).

Management

To a large extent, the success or failure of the new CEHSC-S organization will depend upon how well the directorate's managers – at all levels – perform several key tasks. Whether or not the geographical consolidation occurs, the choice of chiefs for the new divisions and branches will be critical. Most of these positions will be filled by current division or branch chiefs, but there may be some opportunities for new jobs and promotions.

Furthermore, CEHSC-S should actively solicit staff input to and staff participation in the transition process to avoid unnecessary implementation errors

and morale problems. Cooperation and coordination will be essential to minimizing the disruption caused by reorganization while realizing the benefits of the new structure. This means that CEHSC-S management (and staff) will have to continually put directorate and DEH interests ahead of their own.

System Development Center

Moving Fort Lee personnel and jobs to Fort Belvoir will make it harder to work with SDC-L on remaining IFS-M development, but we do not see this as a major problem. The role of SDC-L will be phased down as the remaining modules are completed, and the relocation of CEHSC-S development personnel will not be immediate.

As currently planned, IFS-M will have its software sustained by SDC-L. This presents a larger problem for the new organization since this mission will require substantial coordination with CEHSC-S. As an effective solution, we recommend the transfer of the IFS-M software sustainment function from SDC-L to the System Development Center-Washington (SDC-W), in close proximity to Fort Belvoir.

In addition, SDC-W should be used to support future CEHSC-S development efforts for HOMES redesign, microcomputer-based applications, and other DEH information needs. All of these efforts will be aided by having support located in close proximity to CEHSC-S at Fort Belvoir. We recommend that CEHSC-S pursue these options with the Information Systems Command concurrent with implementing the new organization.

Moving Fort Lee personnel to Fort Belvoir will also make it harder to work with Army logistics activities at Fort Lee. However, we do not see this as a major problem since we believe that this coordination can be effectively accomplished from Fort Belvoir and/or by short-term detailing of CEHSC-S personnel to Fort Lee.

IMPLEMENTATION

A new organizational structure will be of little value to CEHSC-S if it cannot be implemented, and this consideration was a major factor behind our analysis. A well-designed and well-executed implementation will maximize the benefits and minimize the costs of reorganization. To this end, we recommend that CEHSC-S implement the proposed changes in a four-step process over a 2-year period. These four steps (develop transition plans, establish three new divisions, consolidate the DEH

Systems Support Division, and consolidate the PM Division) are described below. (Their timing is summarized subsequently in this chapter in Figure 5-2.)

Step 1: Develop Transition Plans

Assuming that the new structure is adopted, CEHSC-S management will have to develop transition plans for reorganization. The following activities should begin immediately and be completed by the end of March 1990:

- Meet with all CEHSC-S staff (especially, but not exclusively, those at Fort Lee) to discuss the reorganization process and its implications
- Decide which positions in the new organization will be filled by current CEHSC-S personnel and which will be filled by new hires
- Decide who will manage each of the new divisions and branches
- Inform all employees about their job option(s) in the new organization
- Determine which Fort Lee (and other) personnel will be leaving CEHSC-S.

The following activities will take more time; they should begin immediately and should be completed as soon as possible:

- Obtain financial assistance for those people relocating from Fort Lee
- Obtain office space and resources (administrative support, telephones, and computers) for the 20–30 new positions at Fort Belvoir
- Hire and train any replacement or additional personnel
- Transfer contractor operations currently at Fort Lee to Fort Belvoir
- Begin negotiating with SDC-L and SDC-W on support options
- Arrange for CEASA-DC-E personnel to become CEHSC-S employees.

Step 2: Establish Three New Divisions

The second step should be to set up the three new divisions (PM, IRM, and DEH Systems Support) at Fort Belvoir. Any changes affecting CEHSC-S personnel already at Fort Belvoir (new office assignments, new job descriptions, and/or new reporting relationships), plus any changes to the Office of the Chief should be made at this time since no relocation will be involved and since little additional office space will be required. Although some of these new divisions will still be split between Fort Belvoir and Fort Lee, it is important to create and set in motion the new overall

structure as soon as possible. We recommend that this step begin in April 1990 after the initial transition plans have been made and that it be completed by the end of June 1990.

Step 3: Consolidate DEH Systems Support Division

The Systems Maintenance Branch (CEHSC-SS) at Fort Lee will be incorporated into the Facility and Engineering Systems Branch of the DEH Systems Support Division. Similarly, CEHSC-SF at Fort Lee will essentially become the Facility and Engineering Systems Branch of the PM Division. As noted earlier, coordination and control will be greatly improved if both of these divisions are consolidated at Fort Belvoir.

This will mean relocating Fort Lee operations to Fort Belvoir. We believe that the affected groups should be relocated in two stages since they are both physically and organizationally separate (although they work together on IFS-M interfaces). For the reasons described below, we recommend that the DEH Systems Support Division be consolidated – i.e., that CEHSC-SS personnel at Fort Lee be relocated – as the third step of the implementation process (the division will have already been created in Step 2).

First, the Systems Maintenance Branch is smaller and has a less volatile (although no less important) workload than CEHSC-SF, so this move would be the less expensive and less disruptive of the two. Second, the costs of this move are not likely to decrease over time, while the benefits could be realized at once. Third, temporarily leaving CEHSC-SF at Fort Lee could give these CEHSC-SS personnel a short-term alternative to the choice of relocating or resigning.

There is no value to beginning this consolidation process until the underlying organizational structure is established. However, once this has occurred (i.e., once Step 2 is finished) the move should take place as soon as possible. Accomplishing the move through attrition – i.e., by replacing Fort Lee personnel when they leave with new personnel hired at Fort Belvoir – would result in divided and ineffective branches. To allow for logistical complications, to provide for some flexibility in the relocation schedule, and to avoid spanning 2 fiscal years, we recommend that this step be executed during the 3-month period beginning in July 1990 and ending in September 1990.

Step 4: Consolidate PM Division

The fourth step of the implementation process will be to consolidate the PM Division at one location. This will mean relocating CEHSC-SF from Fort Lee to Fort Belvoir. For four reasons, we believe that this move should not take place until 1991. First, more time will be needed to accommodate the logistical requirements of this larger group. Second, the adverse impact on IFS-M will be much less if a substantial amount of deployment has been completed before this move. Third, it will be beneficial to have a short change-free period between Step 3 and Step 4. Finally, as with Step 3, we feel that there are advantages to completing the move during a single fiscal year. We therefore recommend that this step be executed during the 6-month period beginning in April 1991 and ending in September 1991. At this same time, any remaining support functions should be transferred from SDC-L to SDC-W.

Recommended Timing

Figure 5-2 is a time line that summarizes the recommended timing for implementation. Careful handling of the implementation process should assure a smooth transition of responsibilities, limit organizational and personal turbulence, and result in a much improved CEHSC-S. Table 5-2 summarizes the relationships between the old and new organizational divisions/branches.

NONORGANIZATIONAL RECOMMENDATIONS

The primary purpose of the study is to see whether CEHSC-S should be reorganized to improve its efficiency and effectiveness. However, as noted in Chapter 3, reorganization – while necessary – is not sufficient to meet all of the challenges facing CEHSC-S. On the basis of our analysis, we recommend that CEHSC-S take the following actions in addition to implementing the new organizational structure:

- Perform short-term planning to avoid crisis management
- Develop longer term goals and plans for DEH automation
- Give hardware and software integration much higher priority
- Make greater use of new technologies and techniques, especially personal computers
- Promote input from and communication among MACOMs and DEHs

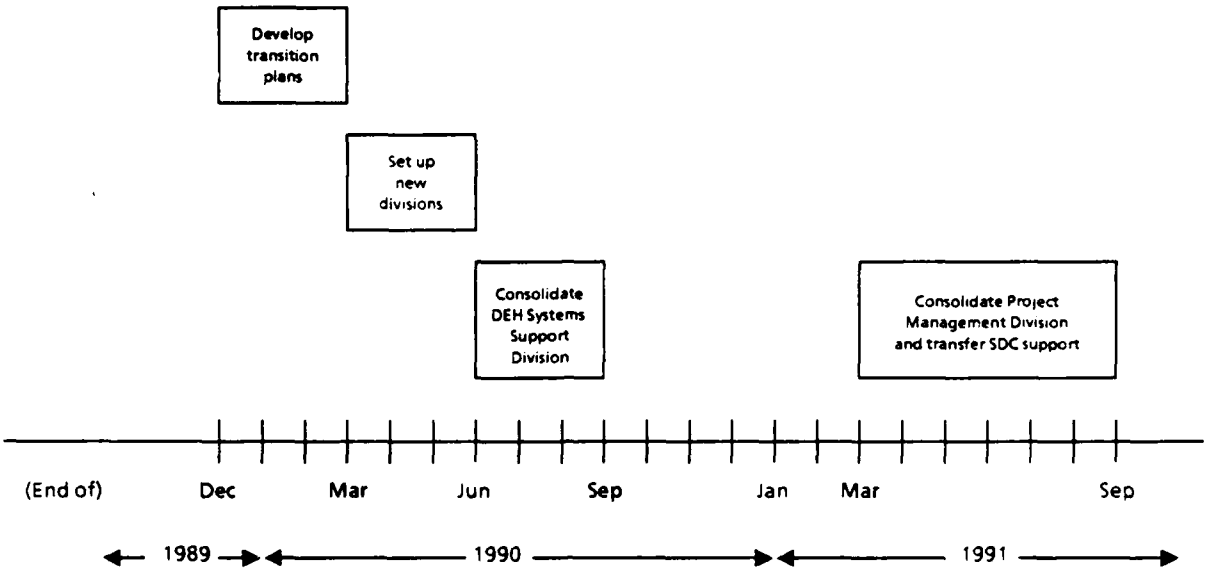


FIG. 5-2. PROPOSED IMPLEMENTATION TIME LINE

TABLE 5-2

RELATIONSHIPS BETWEEN OLD AND NEW ORGANIZATION

Old	New
CEHSC-SF	Project Management Division Facility and Engineering Systems Branch
CEHSC-SS[a]	DEH Systems Support Division Facility and Engineering Systems Branch
CEHSC-SH[b]	Project Management Division Housing Support Systems Branch
CEHSC-SH[b]	DEH Systems Support Division Housing Support Systems Branch
CEHSC-SP	Information Resource Management Division
CEHSC-SI	Project Management Division
IFS-M Acquisition	Project Management Division

[a] Both branches of old division will be combined in new division.

[b] Old division will be split between two new divisions.

- Resolve personal conflicts among CEHSC-S management and staff
- Improve communications within all levels of the directorate.

SUMMARY

People in CEHSC-S are doing a good job carrying out a difficult and important mission. However, improvements are needed if they are to keep doing a good job in the future. In addition to the challenges presented by changes in technology, the DEH environment, and available resources, CEHSC-S is struggling with a number of complex issues. Restructuring the organization, which has evolved into its current form by default rather than by design, will help address those issues (although it will not be sufficient in itself).

We recommend that CEHSC-S adopt a new organizational structure, which we have called a modified matrix (since it has product-oriented branches within life-cycle-oriented divisions). This structure minimizes the efficiency problems associated with product organizations, the coordination problems associated with life-cycle organizations, and the management problems associated with matrix organizations. At the same time, it captures the major benefits of all three of those organizational types.

A smooth transition into this new organization will be critical to its success. We have therefore presented a four-step, 2-year plan for CEHSC-S to implement this structure. This plan includes moving the two groups currently at Fort Lee to Fort Belvoir. We recognize that CEHSC-S management may not want to make these moves because of the expected cost, turnover, and/or disruption. We also recognize that CEHSC-S may not be able to make these moves because of funding, space, or other logistical limitations. Nevertheless, we believe that the moves are highly desirable although the new organization will represent an improvement even if the moves do not occur.

APPENDIX A

LIST OF INTERVIEWS AND CONTACTS

LIST OF INTERVIEWS AND CONTACTS

U.S. ARMY ENGINEERING AND HOUSING SUPPORT CENTER EXECUTIVE OFFICE (CEHSC-ZA)

Dr. L. H. Blakey
Director

Mr. George Braun
Executive Director

U.S. ARMY ENGINEERING AND HOUSING SUPPORT CENTER DIRECTORATE OF SYSTEMS INTEGRATION (CEHSC-S)

Mr. Peter Sabo
Chief, Directorate of Systems Integration

Mr. Leo Oswalt
Office of the PM/IFS-M

Mr. Al Csontos
Planning and Integration Office

Mr. Peter Gentieu
Mr. Dave Howard
Ms. Bonnie Annis
Housing Systems Support Division

Mr. Tony Vajda
Mr. Bob Flores
Mr. Chip Reid
Mr. Cleve Regis
Mr. Jim Asbury
Mr. Gene Hoilman
Ms. Melda Witherby
Mr. Russ Thompson
Systems Sustainment and Customer Support Division

LIST OF INTERVIEWS AND CONTACTS (Continued)

Mr. Jack Malone
Mr. Frank Schwenk
Mr. Lanny Beaty
Mr. Curt Young
Ms. Peggy Brennan
Mr. Jeff Holste
Mr. Herb Harrod
Mr. Jim Godwin
Mr. Ken Ralph
Facility Engineering Support Division

U.S. ARMY INFORMATION SYSTEMS SOFTWARE DEVELOPMENT CENTER – LEE DIRECTORATE FOR ARMY SUPPORT SYSTEMS, FACILITIES SYSTEMS DIVISION

Mr. Richard Delong
Chief, Facilities Systems Division

Mr. Hal Wynne
IFS-M Team

U.S. ARMY ENGINEER AUTOMATION SUPPORT ACTIVITY ENGINEERING AND HOUSING SYSTEMS DIVISION (CEASA-DC-E)

Mr. Dick Farner
Chief, Engineering and Housing Systems Division

Mr. Paul Garland
Contract Support

DIRECTORATE OF ENGINEERING AND HOUSING FORT MEADE, MARYLAND

Mr. Greg Moore

DIRECTORATE OF ENGINEERING AND HOUSING FORT BRAGG, NORTH CAROLINA

Mr. Carroll Beard
Mr. Edgar Edge
Ms. Cindy DeReyna

LIST OF INTERVIEWS AND CONTACTS (Continued)

DIRECTORATE OF ENGINEERING AND HOUSING
FORT LEONARD WOOD, MISSOURI

Mr. Tom Wycott
Ms. Wanda Cross
Ms. Lisa Campbell

HEADQUARTERS, U.S. ARMY TRAINING AND DOCTRINE COMMAND
FORT MONROE, VIRGINIA

Mr. Dennis Weber
Mr. Oakley Drumheller

HEADQUARTERS, U.S. ARMY MATERIEL COMMAND
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APPENDIX B

DIRECTORATE OF SYSTEMS INTEGRATION PERSONNEL SURVEY

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GENERAL

We conducted a survey of the Engineering and Housing Support Center's Directorate of Systems Integration (CEHSC-S) personnel in August and September 1989. The directorate identified participants for the survey. Thirty-nine people were available to respond. The survey included nine closed-ended questions; respondents recorded their perceptions on a Likert scale (from strongly agree to strongly disagree). They were also asked to respond to 12 open-ended statements, and several employees were interviewed. These three data-gathering techniques provide an accurate assessment of the pressing issues for the directorate. Our analysis includes data from all of these sources. The population analyzed in our survey included directorate personnel from all levels. We took measures to ensure that no individual employee could be identified.

RESULTS

What Employees Liked Most About CEHSC-S

Respondents at Fort Lee are pleased with the teamwork there and the relationships they have developed. They perceive a good sense of cooperation. Those at Fort Belvoir speak of being able to help people at other installations, providing a service, and being part of stimulating work. Others speak positively about accomplishing something important; some also feel that the environment and the facilities contribute well to their performance.

What Employees Liked Least About CEHSC-S

All respondents at Fort Lee seem to want better management, less red tape, no relocation threats, better human resource management, and better strategic planning. The complaints about red tape in many cases referred to difficulties in communicating upward or downward through the various levels of CEHSC-S management and were not directed at procedures or paperwork per se. Some of these responses were almost identical. Respondents at Fort Belvoir were less obvious in

their consensus and wrote about the absence of consistency in management's direction and the negative undercurrents associated with office politics.

What Employees Would Change About CEHSC-S

At Fort Lee, respondents generally cited the need for better management and better communication, although they were not very specific about where better management was needed. At Fort Belvoir, respondents indicated the need for clear goals and priorities and even for management by objectives. There was a strong sentiment in favor of reorganization, although opinions varied regarding the best organizational structure for the directorate.

Strategy

Strategy questions concerned the organization's decisions on meeting the demands of the environment. Every respondent from Fort Lee wrote about the need to do strategic planning and to have organizational goals that are identifiable and measurable. Some stated that management should promulgate the strategy so all could see it. Fort Belvoir employees also spoke of these issues, but concentrated on the need for management to coordinate and communicate better.

Tasks

Respondents were asked to comment on the directorate's tasks and their own specific work. Three critical factors bear on this subject:

- *Uncertainty:* The absence of information or direction concerning future work requirements
- *Difficulty:* The complexity of work as measured by the education, technical understanding, or specific skills necessary for its performance
- *Diversity:* The varied outputs or results of the work done by the organization.

Both Fort Lee and Fort Belvoir respondents cited the need to improve communication, delegate authority, and establish and publish organizational goals. Of the issues mentioned, improving communication within the directorate was the most often stated means by which it is felt performance of tasks could be made easier and more effective.

Structure

Questions on structure address formal and informal arrangements that develop or are created in an organization to help individuals perform tasks. Those arrangements reflect organization structure, informal networks, and methods and practices, which are defined as follows:

- *Organization structure:* Deals with the division of labor; how various functions, jobs, or roles are grouped in subunits based on the demands of the work. The mechanisms in place for linking subunits to provide accurate and timely information when needed.
- *Informal networks:* Deals with the structures and processes that inevitably emerge in the organization although they are neither planned nor formally prescribed. They include the "grapevine," norms, unofficial committees, necessary decisions made and carried out without formal authority, temporary groups and task forces, etc.
- *Methods and practices:* Deals with policies, rules, procedures, and guidelines established for doing work in the organization.

The respondents generally felt that the present organization structure does not make their work, communication, or decision making easier. They disagreed slightly with the statement that the "organization's formal structure is the same as the informal structure." Similarly, they were slightly skeptical of the notion that responsibilities are clearly laid out and well understood and that the rules and policies help get the job done. On average, they feel that coordination with other divisions and branches of the Engineering and Housing Support Center is usually accomplished with some difficulty. To improve the organization and procedures, respondents tended to recommend improving communications and stressing organizational goals.

People

We included a question about personnel in our survey. That question involved the following elements:

- *Training:* the knowledge and skills people have in relation to their job requirements.
- *Selection:* the guidelines and criteria the organization uses to select personnel for specific jobs

- *Recruiting:* the process the organization uses to attract and hire new people
- *Transfer:* the process the organization uses to relocate people in different groups and/or locations.

Most responses focused on training. Nearly everyone wrote of the need for training, cited individual development plans that are not followed, or complained that some personnel did not receive the training they had been promised.

Rewards and Pay

Respondents were asked about rewards and pay – the formal and informal motivators that cause people to produce desired results. They include the following:

- *Promotion/compensation systems:* the flexibility, frequency, and visibility of these systems
- *Awards:* the flexibility, visibility, and frequency of the awards system
- *Reward expectations:* the perceptions people have about the relationship between their performance and possible outcomes or rewards.

Fort Lee employees were in favor of "pay for performance." Most respondents felt that awards were generally fair although several indicated that care must be taken in selecting award recipients.

Technology

Technology questions concerned the equipment/machinery/tools (hardware) and the knowledge/procedures/data (software) necessary to do the organization's tasks. Employees at both sites agree that they have sufficient equipment to do their job but are less certain that the organization uses its equipment efficiently. Respondents believe that technology shortfalls experienced by some employees can be overcome by implementing training, improving hardware and software, and modernizing the telephone system.

Management

Our survey asked about the management processes and mechanisms that the organization uses to carry out its work. Those processes include information and communication systems, planning and control, performance measurement, decision making, conflict management, goal setting, and job evaluation. Fort Lee respondents indicated that they want better management and more authority delegated to them;

some cited a need for better human resource management. At Fort Belvoir, respondents indicated that they want strong people-oriented leadership.

Leadership

Our survey addressed the leadership style used in the directorate in various situations. At Fort Lee, respondents are again looking for better management that can delegate authority. Some Fort Lee respondents suggested using quality circles. Fort Belvoir respondents wrote about the need for a clear mission with realistic goals.

Climate

Another question on the survey dealt with organizational climate. Fort Lee respondents indicated the need to establish better communication, delegate authority more effectively, develop better management, and eliminate relocation threats. Fort Belvoir respondents wrote about the need for leaders to be more human and less egotistical in their dealings with others. Fort Belvoir respondents are looking for a change in management and leadership philosophy to one that shows a greater concern for people.

RECOMMENDATIONS

The data indicate that CEHSC-S personnel need more information on the directorate's current short-term and long-term plans. In addition, CEHSC-S managers should implement those plans in a meaningful way throughout the directorate.

CEHSC-S top management should consider using management-by-objective techniques, including review and analysis. Personnel in CEHSC-S appear to want structured CEHSC-S goals and objectives.

Top CEHSC-S management should assess training requirements. Apparently, personnel who need training are, in fact, not being trained. Additionally, individual development plans – valuable personnel tools – apparently have not been used throughout the directorate.

These data suggest that a formal analysis of equipment needs should be performed. Although responses to the questionnaire indicated a need for better hardware and software, few specific requirements were cited.

CEHSC-S management may wish to consider directorate team building so that managers can learn from each other. The management may also wish to consider management development courses for subordinate managers.

Finally, the fact that so many respondents commented on the need for better management indicates that additional investigation of this problem should be undertaken.

APPENDIX C

DIRECTORATE OF ENGINEERING AND HOUSING INFORMATION SYSTEMS SURVEY

DIRECTORATE OF ENGINEERING AND HOUSING INFORMATION SYSTEMS SURVEY

INTRODUCTION

We surveyed Directorates of Engineering and Housing (DEH) to evaluate support services provided by the Directorate of Systems Integration (CEHSC-S) for each major support function and major information system. Respondents were asked to identify CEHSC-S activities they wished to see increased and those that they wished to see decreased, and to suggest how CEHSC-S might otherwise improve its effectiveness.

SAMPLE AND RESPONDENT CHARACTERISTICS

We chose the larger installations for which CEHSC-S provides DEH system support as our sample and distributed 130 surveys to DEHs at those installations. Sixty of those surveys were returned, a response of slightly under 50 percent. Because we did not have a specific individual contact at each DEH, we found it difficult to ensure that the survey reached the right person. Furthermore, because any follow-up was virtually impossible, the response rate was relatively low. The breakdown of respondents by major command is shown in Table C-1.

TABLE C-1

SURVEY RESPONDENTS BY MAJOR COMMAND

Forces Command	21
Training and Doctrine Command	12
Army Materiel Command	8
Eighth U.S. Army	4
U.S. Army, Europe	3
Western Command	2
All other commands	10
Total	60

SUPPORT FUNCTION RATINGS

We studied seven CEHSC-S support functions: system development, equipment acquisition, system deployment, system sustainment, training, user documentation, and technical support. The historical level of support received, the quality of that support, and the level of support expected in the future were rated for each of those functions. The average ratings are shown in Table C-2.

TABLE C-2

AVERAGE DEH RATINGS OF CEHSC-S SUPPORT BY FUNCTION

Function	Historical level of CEHSC-S support[a]	Quality of CEHSC-S support[b]	Future level of CEHSC-S support[a]
System development	1.6	2.3	2.4
Equipment acquisition	1.8	2.4	2.1
System deployment	1.8	2.4	2.4
System sustainment	1.8	2.3	2.5
Training	2.0	2.5	2.7
User documentation	1.8	2.2	2.5
Technical support	2.0	2.4	2.5

[a] Rating scale: 1 = Low; 2 = Medium; 3 = High.

[b] Rating scale: 1 = Poor; 2 = Fair; 3 = Good.

Historical levels of support for these seven functions were generally rated in the low-to-medium range. Required future levels of support (generally rated in the medium-to-high range) are expected to increase for all seven functions. The DEHs seemed fairly happy with the quality of support received from CEHSC-S, with ratings generally in the fair-to-good range. For all three questions (historical level, quality, and future level), the differences in average ratings among the seven support functions were fairly small.

INFORMATION SYSTEM RATINGS

The survey was also used to determine which information systems were installed at each installation, the historical and future levels of support received or required for each system, and the quality of that support. These systems included

Integrated Facilities System I (IFS-I), Facilities Engineering Supply System (FESS), Integrated Facilities Data Entry Process (IFDEP), Job Order Contracting (JOC), Headquarters Integrated Facilities System (HQIFS), Integrated Facilities System II (IFS-II), Integrated Facilities System Mini/Micro (IFS-M), Housing Operations Management System (HOMES) (Assignments and Terminations, Housing Referrals, and Billeting), and Facilities Engineering Job Estimating System (FEJE). The proportion of respondents who used each system and the average ratings are shown in Table C-3.

TABLE C-3

AVERAGE DEH RATINGS OF CEHSC-S SUPPORT BY SYSTEM

System	Proportion of DEHs using (percent)	Historical level of support[a]	Quality of support[b]	Future level of support[a]
IFS-I	80	2.2	2.3	1.9
FESS	76	2.2	2.3	2.4
IFDEP	79	2.1	2.3	2.0
JOC	35	1.3	2.0	2.6
HQIFS	27	1.9	2.2	2.1
IFS-II	7	1.7	1.5	1.2
IFS-M	6	2.6	2.7	2.7
HOMES	78	2.2	2.5	2.4
Assignments and Terminations	64	2.4	2.5	2.5
Housing Referrals	51	2.3	2.4	2.5
Billeting	62	2.1	2.4	2.5
FEJE	81	2.2	2.4	2.4

[a] Rating scale: 1 = Low; 2 = Medium; 3 = High.

[b] Rating scale: 1 = Poor; 2 = Fair; 3 = Good.

Historical levels of support for these systems varied considerably. The highest average ratings were IFS-M (note the low proportion using), FESS, FEJE, and HOMES, while the lowest were for JOC, IFS-II, and HQIFS (all of which were installed at fewer than half of the responding installations). Future levels of support

were expected to increase for most systems. The highest average ratings were for IFS-M and JOC, while the lowest were for IFS-II and IFS-I (both of which will be replaced by IFS-M). The quality of support received varied by system; the highest average ratings were for IFS-M (although it had an extremely small installed base) and HOMES, while the lowest were for IFS-II (which also had a very small installed base) and JOC.

OPEN-ENDED QUESTIONS

Finally, respondents were asked several open-ended questions to determine what CEHSC-S support they wished to see increased, what support they wished to see decreased, and how they thought CEHSC-S could improve its support. The following were the main DEH respondent requests and recommendations:

- Increase on-site training and assistance
- Update software and hardware
- Decrease contracting for systems development
- Impose fewer regulations
- Provide faster support to customers
- Improve system and user documentation
- Increase input from the field.

SUMMARY

We received responses from a large and representative sample of DEH respondents. They were generally pleased with the quality of CEHSC-S support. However, the levels of support required by those respondents in the future are expected to increase for most systems and functions covered in our survey. The greatest expected increases in the level of support required, and the greatest potential increases in the quality of that support, are for system sustainment and related areas such as training and documentation.

19. Abstract (continued)

- Systems sustainment and customer support activities are centralized for all systems.
- Planning and integration activities are given increased resources and a higher priority.