GUIDELINES FOR DEVELOPMENT OF A BASE COMMANDER'S MANUAL FOR FACILITIES MANAGEMENT

THESIS

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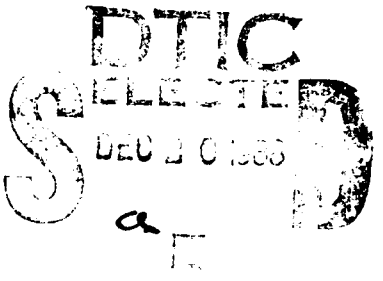

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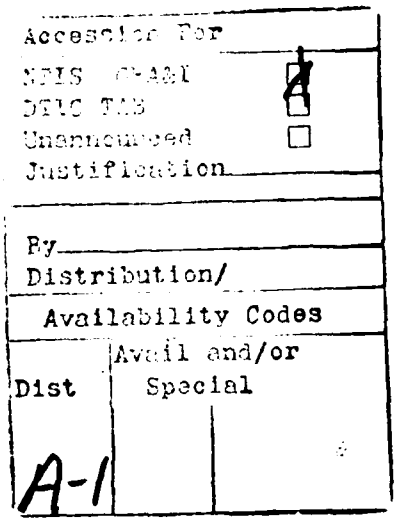

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THESIS

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

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Preface

I wish to express my appreciation to my thesis advisor, Dr. Charles R. Fenno, for his patient assistance and keen sense of focus. I also wish to thank the remaining members of my thesis committee, Lt Col Jacob D. Dustin and Major Larry J. Blake, for their guidance and ever-present support.

In addition, I would like to thank the fifty Base Commanders and Base Civil Engineers who took time to share their insights. I also appreciate the cooperation of the faculty of the School of Civil Engineering and Services, who graciously contributed their professional experience through the information they shared.

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Abstract

The purpose of this ~~study~~ was twofold. The primary intent was to identify appropriate content for a reference manual that would summarize for Base Commanders and Deputy Base Commanders, procedures and constraints involved in the management of Air Force facilities. The secondary intent was to produce an outline for this manual.

The research was directed by six investigative questions that include the following: 1) What are the responsibilities of the Commander's job in facilities management? 2) What information sources are available to prepare the new Commander for these responsibilities? 3) What information do these sources give the Commander? 4) What additional information, not supplied by existing sources, do experienced Commanders say they need to know about facilities management and civil engineering operations? 5) Where can this additional information be found? 6) How can this information be compiled into a book format useful to Commanders? The research answers each of these questions.

Information and topics were gathered through 50 structured telephone interviews of 25 Base Commanders and 25 Base Civil Engineers. In addition, information was gathered from research of literature, review of the curricula of two

Commander's facilities management courses, and interviews of topic specialists. Research also included the aspects of manual design characteristics.

The research identified 16 topics that a reference manual on facilities management should include to fulfill the needs of Base Commanders. Topics identified for inclusion are: Base Civil Engineering Organization, In-Service Work, Civil Engineering and Contracting, Requirements Identification and Programming, Approval Authority, Financial Management, Military Construction Program, Comprehensive Planning, Military Family Housing, Environmental Planning Overview, Asbestos Management, Facility Energy Management, Infrastructure, Funding of MWR Facilities, Mission Changes, and Statutory Limitations.

GUIDELINES FOR DEVELOPMENT OF A BASE COMMANDER'S MANUAL FOR FACILITIES MANAGEMENT

I. Introduction

Overview

In order to describe the specific research problem investigated in this study, this chapter provides an introduction to the general problem area, followed by a statement of the specific problem that the study addresses. Next, the specific problem is subdivided into six investigative questions which guided the study. Facilities management is defined. Finally, assumptions underlying the research and a statement of the project's scope are provided.

General Issue

The Base Commander's (BCC's) position is described in Air Force Regulation 36-1 under the general title "Organization Commander." Responsibilities are limited to command of nontactical units but cover a very broad range of responsibilities. The Commander formulates plans and policies for personnel, training, administration, recreational services, engineering and construction, services, law enforcement, and crash rescue and fire protection. In addition, the Commander selects and assigns commanders of specialized squadrons, convenes summary courts, and approves special court martial and discharge actions for all

installation personnel. These responsibilities involve interacting with military members, civilian employees, and civic organizations (10:Attachment 5).

Air Force Base Commanders are responsible for over 135 major air bases with a combined replacement value of 115 billion dollars. These assets include 66,000 buildings covering 727 million square feet. The average age of these buildings is 30 years, which is beyond their original design life. Besides these assets, Base Commanders are responsible for real estate, paved and unpaved roads, runways, vehicles, and personnel--a diverse range of responsibilities (1:B-2).

The Commander's responsibilities in facilities management are, at best, time consuming to master. In instances where the Commander is not a practicing engineer from the civil engineering career field, the amount of information he or she must learn quickly is even larger.

The Air Force strives to help the Base Commander achieve maximum effectiveness in facilities management with two courses. The two Commander's courses are the Management 002 course, titled Commanders' Engineering and Services Orientation Course, taught at the Air Force Institute of Technology's School of Civil Engineering and Services at Wright-Patterson AFB, Ohio; and the Base Commander's Course taught by the Air University's Center for Professional Development and Management, at Maxwell AFB, Alabama (28, 15). The Commanders' Engineering and Services Orientation

course is generally taught twice a year. Each class at Wright-Patterson can accept between 25 and 30 students. Because part of the 50-60 students in each year is made up of Wing and Vice-Wing Commanders, fewer than 50 Base Commanders and Deputy Base Commanders complete this course annually (15).

The Base Commanders' course is generally taught three times a year. Each class is authorized 29 students for a total of 87 students annually. In reality, 75 to 80 Base Commanders, Deputy Base Commanders, and Wing Commanders take the class annually (28).

The result is that approximately one third of the total number of new Base Commanders could attend at least one of these courses in any given year (28). Therefore, a new Base Commander without experience in facilities management is not necessarily provided the opportunity to attend a course.

Currently, the Commanders' Engineering and Services Orientation course at Wright-Patterson AFB consists of a one-week (four-and-a-half day) lecture and guest speaker curriculum. In addition to facilities management, the curriculum includes approximately one day of services training (1:iii-a). The Base Commander's course at Maxwell AFB is four weeks long, but includes many areas outside of civil engineering. At Maxwell, the Commanders receive less than three-and-one-half days of civil engineering and services training (3:ii).

One knowledgeable individual has suggested that Base Commanders, whether or not they have attended the courses, need rapid access to concise and current information about facilities management (15). This information would be presented in a compact, desk top reference format. For those who have attended the course, this information would supplement course content; for those who have not attended, the information would be their only formal introduction to how Civil Engineering implements Air Force regulations concerning facilities management.

Specific Problem

The purpose of this study is (1) to determine the appropriate content of a reference manual that will summarize for the Base Commander the procedures and constraints within which he/she must operate to manage Air Force facilities and (2) to produce an outline for such a manual. This outline would aid a researcher in a future effort to write such a manual. In turn, this manual would allow the Base Civil Engineer (BCE) to understand and efficiently support the Commander's needs. By reviewing this outline and the proposed manual, the civil engineer would be exposed to the topics that Base Commanders have identified as areas they desire to gain additional information about.

Investigative Questions

The following questions must be answered:

1. What are the responsibilities of the Commander's job in facilities management?
2. What information sources are available to prepare the new Commander for these responsibilities?
3. What information do these sources give the Commander?
4. What additional information not supplied by existing sources do experienced Commanders say they need to know about facilities management and civil engineering operations?
5. Where can this additional information be found?
6. How can this information be compiled into a book format useful to new Commanders?

Definition of Facilities Management

As used in this study, facilities management consists mainly of three elements:

1. Provides facilities - buildings, roads, runways, utilities, and real estate.
2. Rehabilitates and renovates facilities - improving or changing the usefulness of facilities (falls outside maintenance).
3. Maintains facilities - scheduled and non-routine maintenance (outside of user up-keep).

It also includes specialized tasks such as fire protection.

Assumptions

1. The Base Commanders interviewed would be able to identify important topics and shortcomings of their own training, and then share the information.

2. Bias could be minimized during the interview process. Some Base Civil Engineers feel civil engineering in the Air Force is reactive verses proactive. They feel that it is impossible to anticipate the problems that will be encountered in the job, so their job is basically to react to problems that develop. On the other hand, many managers feel that it is essential to anticipate the problems or types of problems to be faced in the future and take preemptive action, or preparatory action to be able to better correct or prevent an adverse event from occurring.

This reactive attitude leads to the opinion that writing a manual for Base Commanders on facilities management is unnecessary. It is better for the Commanders to continue calling the BCE with the problems and questions the BCC has. The proactive position would be that it may be possible to write a guide to help Base Commanders. The sharing of the experiences of BCEs may assist the process, and objective answers are necessary to facilitate the process.

Scope and Limitations

The following limitations apply to this research:

1. Only Base Commanders of continental United States Air Force bases were contacted.

2. Course curriculum materials were the latest available.

3. Current Base Commanders and Base Civil Engineers with at least six months experience were contacted.

4. Investigations include current training programs.

5. The research investigated only civil engineering facilities management.

II. Literature Review

Purpose

The purpose of this chapter was to review information available to the Base Commander in the area of facilities management. A review of the available literature provided answers to investigative questions number one, two and six. Investigative question number one asked, "What are the responsibilities of the Base Commander?" Investigative question number two, which for clarity, is answered in Chapter IV asked, "What sources are available to prepare the Commander for the Base Commander's job?" The last question addressed in this chapter is investigative question number six, which asked, "How can additional information that Base Commanders identify they need be compiled and presented in a book format useful to the new commander?"

Define Literature

Before the investigative questions could be answered, it was necessary to define what is and what is not meant by the term "literature." For purposes of this report, literature does not include the course materials from the Base Commander's Course or the Commanders' Engineering and Services Orientation Course, unless the material has been published in another information source.

The lack of widespread availability and the lack of complete, in-depth coverage of topics limits the adequacy of

the course materials as stand-alone reference materials. The Base Commander benefits most when the printed course material has been accompanied by classroom instruction. Therefore, this printed course material should be classified as class notes.

"Literature" refers to materials available to the Base Commanders to assist them in the accomplishment of the responsibilities of the Base Commander's job. Literature in this case includes regulations, manuals, pamphlets, and published books and articles.

Investigative Question Number One

1. What are the responsibilities of the Commander's job in facilities management?

Air Force Regulation 36-1, Officer Air Force Speciality: Organization Commander identifies the responsibilities of the Base Commander. The general responsibilities are command of a nontactical unit and include formulating plans and policies for personnel, training, recreational services, engineering and services, law enforcement, crash rescue, and fire protection. In addition, the Base Commander is responsible for military discipline (10:Attachment 5).

This study is concerned with the Base Commander's responsibilities in facilities management. Air Force Regulation 85-1 states that the Base Commander's instrument for accomplishing facilities management is the Base Civil

Engineering (BCE) squadron. The Base Civil Engineer, who is the Civil Engineering Squadron Commander, is responsible to the Base Commander for accomplishing facilities management responsibilities (11:11).

The Base Commander is thus responsible for ensuring that the Civil Engineering Squadron's mission is accomplished. Specifically, the Base Civil Engineering squadron's primary operations and maintenance mission is "to acquire, construct, maintain and operate real property facilities, and provide related management, engineering and other support work and services" (11:2).

Investigative Question Number Six

6. How can this additional information be compiled into a book format useful to new Commanders?

Introduction. There has been extensive research done in the area of presentation of material, and much of it is relevant to production of a manual. The vast majority of recent material has been written for the producers of computer manuals. This is a specific area of manual design, but it is relevant to any presentation of information in the manual format.

Overview. Areas addressed in this literature review on production of a manual include understanding the audience, the importance of format, the elements of format, the principles of illustration, and Air Force policies and procedures.

Understanding the Audience. Writers must consider the reader's needs any time they construct a manual. It is necessary to consider several factors, including age, education, experience in the field, and the main reason for looking at the manual. Writers must focus on the reader's goals and thought process, not their own. In the case of a reference manual, the writer must consider what the reader really needs at that moment. The writer must consider whether it is necessary to present definitions, exceptional situations, or perhaps directions on where to go for additional information. It is important that the writer adopt a familiar order of presentation. And finally, the writer should summarize, because it helps the reader review and memorize the material (21:111-128).

The Importance of Format. Format refers to the general make-up, or arrangement of a book or magazine. Format includes items such as the shape, size, binding, type face, paper and other design characteristics (26:54).

Cynthia Craeger, a technical writer for the Hewlett-Packard Company, says that,

> unfortunately, there is no magic formula that produces the optimum format for all situations. Format decisions must be based primarily on such considerations as who the audience is, what the purpose of the document is, and how the document will be used. Once these questions are answered, you can follow established principles of design and typography to help reduce the trial and error of developing a good format (6:W&E-147).

Sherry G. Shouthard, Assistant Professor of English at Oklahoma State University states that,

> format in sets of instructions and manuals is important for three reasons: (1) it can make an audience want to use them, (2) it can help an audience find and understand information quickly and easily, and (3) it can emphasize important information so that an audience does not overlook it (22:203).

The Elements of Format.

The Binder. The binder refers to the cover which holds the pages of the manual together. There are several considerations in selecting the correct binder. A frequently used manual would require a cover which can withstand heavy use. Also, it is suggested that the binder must keep its pages open when users remove their hands or set the manual down. If the manual is to be revised often, it must have a binding that users can open to change pages (22:204). Looseleaf binders are easy to update, although they are considered cumbersome for frequent use (23:8-12).

Other considerations in cover selection include size and color. A smaller size, a common size for a book (6 1/2 by 9 inches), seems better for a manual; otherwise the manual should be the common 8 1/2 by 11 inches (23:8-12). In addition, the name of the manual and author's name should be able to be read from a distance of at least 8 to 10 feet (27:321). It has been suggested that white or light letters on a dark background are easier to read, especially from a distance.

Principles for Organizing Text.

Provide an Overview. The purpose for an overview is to introduce the reader to new concepts, stress key points, preview the structure of material, and relate material of previous sections. The length of the introduction varies, frequently from one paragraph to two pages (17:13-16). An overview should be provided for every section (21:72-73). The most important ideas should be presented first in the overview (21:74). Additionally, the writer can speed-up access for the reader by including at least a summary, glossary, and index (21:8-9).

Informative Headings. Headings serve several useful functions. They show organization, describe material, make the manual easier to use and understand, and aid the reader in understanding the prose (17:17-20). Words should be clear and simple, and titles short enough to scan (21:65-71). In the broader sense, the writer can add interest and make the manual a useful reference tool by using colored stock, heavier stock, or tabs to open new chapters or sections (6:W&E-148).

Table of Contents. A table of contents is a must for long documents, especially when the reader uses the manual as a reference to find something quickly, to answer questions, provide phrases, names, or short descriptions (17:21-24). The table of contents is very useful when it answers the questions what, where, and how. As a minimum,

the table of contents should include chapter titles, subheadings, and page numbers (21:74). Two ideas to aid in word selection in the table of contents are: 1) use verbs when you can, and 2) don't bunch nouns (21:65). A format that can be very useful to show the reader how to use the manual is "To do this - Turn to this section" (21:67).

Other format ideas useful for reference purposes include using pagination by chapter, including a glossary of terms, and providing a detailed index. A better sense or order can be transmitted to the reader when pagination by chapter is followed. In addition, this style of page numbering "is more efficient for production" (6:W&E-148). Replacement pages can simply be given the number of the page being replaced, while additional pages can be given subscripts to numbers of the page they continue.

Other format techniques include developing a glossary of many terms used, and a detailed index at the back of the book will be most beneficial to the reader (21:7). A key to developing an index is to invert phrases and use both synonyms and singular form key words. It is common practice to capitalize the first letter of each entry in the index (21:135-138).

Principles for Writing Sentences. Some guidance for sentence construction is provided in Tongue and Quill (14:39-50). In addition, a few points are emphasized by communications research. First, a writer should use active

voice, where the subject performs the action expressed by the verb (17:27). Second, use of personal pronouns is recommended. And finally, use of nouns created from verbs is undesirable--the use of action verbs is preferred (17:35-38).

Typographic Principles.

Use Highlight Techniques. Highlighting in typography is the use of mechanical methods or styles to draw the reader's attention. Several different highlight techniques can be used to emphasize important points, to set off examples, or create distinct parts of text. Boldface, italics, underlining, and color are common examples of highlighting. Wise use of highlight techniques makes a document look better by creating visual relief (17:40-70). For example, boldface is often used for an important point, white space is used to set off a body of text, and type size can reflect relative importance. In addition, color can be used to make a manual look less official and cold, or color can be used to group information (17:67-70). The writer is warned not to overuse highlighting techniques for fear of creating a cluttered look (17:40-70).

Select Correct Type Size. Use 8 to 11 point type for text (17:73-78, 22:204). Research indicates that type of this size is most readable. The writer must choose type size according to visual size, not point size along. Determine type after testing its readability in the intended

format. Another aid to readability is the use of one to four point lead for sentences, with two points considered optimal (6:W&E-149).

Avoid Lines of Text that are Too Long or Too Short. The optimal length of line is 50 to 70 characters or 10 to 12 words (17:79-80, 6:W&E-149). A line which is too long keeps going on when the reader's eye wants to shift. The reader finds this effect tiring and uncomfortable. On the other hand, the reader finds that a line which is too short requires too much eye movement. This extra eye movement creates a jerky pace resulting in awkward breaks in the text. The reader finds the extra movement to be tiring (17:79).

Use White Space in Margins and Between Sections. Generous use of white space looks better and is easier to read (22:204). White space can be used to emphasize important text by isolating it and can aid transition (17:81-83).

Use Ragged Right Margins. Ragged right margins provide a more relaxed, contemporary look (17:85-86). Furthermore, research points to a ragged right margin being easier to read because the next line is more easily picked out by the reader's eye (17:85-86). In addition, it is easier for the writer to make corrections since there is slack at the end of most lines (17:85-86).

Avoid Using All Caps. Overuse of caps actually decreases legibility. If more than three or four words are placed in caps, the advantage/effect is lost. All caps can be used for major headings, and to emphasize individual words and short phrases in text. The negative aspects of using all caps are that it takes longer, requires more space, and is more difficult to read (17:87-88).

Principles of Illustration. Illustrations are frequently used to supplement text. In many cases, the writer can "use illustrations for areas that may not prompt a clear image in the mind of the reader" (24:G&P-3). The benefits of illustrations are that they help explain, help the reader remember, and keep the reader's interest (17:91-93). The writer is advised to make use of high quality illustrations which visually support text and have a clear purpose (17:91-93). Similarly, the writer should avoid decorations on a page when their only purpose is ornamentation (21:169). The writer can make use of the fact that readers tend to follow left to right, top to bottom, big items to small, black to white, color to noncolor. Knowledge of these reading characteristics can help the writer direct the eye of the reader (20:34).

There are several types of illustrations common to technical reports. The more common examples of illustrations are tables, bar charts, and line graphs. Each type of illustration has special characteristics which make it more

useful in certain situations. In addition, there are situations where each type of illustration may be less useful.

Tables. Tables help to supplement text for quantitative data, to organize long prose, or for lengthy descriptions (17:95-98). In a table it is easier to compare columns than rows (17:95-98). Also, tables are better than graphs for presenting quantitative data, but not for showing trends (17:95-98).

Bar Charts. Bar charts supplement text when comparing sizes, amounts, or different items at different times (17:99-101). Most people can easily understand bar charts (17:99-101).

Line Graphs. Line graphs supplement text to demonstrate how something has changed over time (17:103-105). Unfortunately line graphs are relatively difficult for many readers to interpret, so they should not be used with general audiences or with poor readers--neither of which applies to Base Commanders (17:103-105).

Air Force Policies and Procedures for Publications

Air Force Regulation 5-1, titled "Air Force Publications Management Program," provides policies and procedures for most standard publications. To meet the objectives of Air Force publication management, materials must be accurate, logically organized, and free from

irrelevant and duplicate information. The publication must meet the standards in AFR 5-1 and AFR 5-8.

Together Air Force Regulations 5-1 and 5-8 identify procedures and standards for the review, approval, readability, and format of Air Force Publications. Deviations are tolerated within specified range, and for special publications, with the approval of appropriate agencies (8:2-7; 12:6-8, 42-48). A guide for Base Commanders would not be best served by standard publication format requirements. AFR 5-1 states that the Director of Administration may authorize another format if the prescribed format would be unsuitable for the information being published (8:4). The double column format of standard publications is usually not suitable for a reference guide and would not allow the application of some of the principles presented above.

Air Force Regulation 5-1 states that publications prepared by automated word processing equipment may alter the standard format. An important variation is the allowance for type area to extend across the full width of the page (8:4). In addition, boldface type may be used for chapter and main paragraph title headings. Visual aids do not have a prescribed format (8:4). Nontheless, covers must show publications number, series and publication titles, publication date, and issuing activity (8:5).

The primary factors to comply with include the minimum edit requirements and the draft's readability. The minimum edit requirements include:

1. Ensure the correct type of publication (regulation, supplement, change) and series are used.
2. Verify for accuracy (heading, subject and main titles, title page, footnotes, and signature element).
3. Verify the numbering and use of elements (parts, chapters, sections, and paragraphs, attachments, figures, tables).
4. Edit for correct grammar, spelling, punctuation, capitalization, and use of abbreviations.
5. Verify references to other publications and internal cross reference.
6. Ensure material complies with policies in AFR 5-1 and AFR 5-8.
7. Ensure illustrations are necessary, correctly identified, and can be reproduced.

Draft readability requirements are (8:3):

1. Check the reading grade level (RGL) on Air Force *Form 800*, if required. The publication manager can waive the RGL requirements in some cases. The intended audience of Base Command rs invalidates this requirement.
2. Ensure that the writing style is sound.
3. Apply the plain English standards to draft.

The checklist for English standards is presented below (8:8):

1. Is it written mainly in the active voice in a plain, uncluttered style?
2. Does it contain clearly constructed, grammatical sentences that (a) average no more than 20 words; and (b) contain simple, familiar words, rather than abstract words, unnecessary technical words, and jargon?
3. Does it avoid illogical and inconsistent shifts in the point of view (tense, person, or voice) within a paragraph?
4. Does it present material in a logical, orderly sequence so that (a) each paragraph is limited to one thought or subject, and (b) each paragraph is as brief as possible?

5. Does it use as many main paragraphs as possible, rather than drawn-out subparagraphing?
6. Does it contain clear descriptive titles for parts, chapters, and sections, and paragraphs?

Summary

In producing a manual, a large effort must be directed at making the instrument convenient to the user. To accomplish this, the writer must address the needs of the user. In addition, the information must be presented in a format and typography that make the user's job easier. Format and layout must be inviting to the reader; otherwise, no matter how valuable the information, it may never be read, or perhaps it may not be comprehended. Applying the principles presented will assist in producing a manual that is convenient and agreeable to the reader.

III. Methodology

Overview

This chapter describes the methodology used to answer each of the six investigative questions.

1. What are the responsibilities of the Commander's Job in facilities management?

The answer to research question number one was found by a review of Air Force Regulation 36-1, which covers the responsibilities of the Base Commander. As stated in chapter one, general responsibilities include command of a nontactical unit and include formulating plans and policies for personnel, training, recreational services, engineering and services, law enforcement, crash rescue, and fire protection. In addition, the Base Commander is responsible for military discipline.

This study is concerned with the Base Commander's responsibilities in facilities management. To support this effort, Air Force regulations pertaining to Base Civil Engineering were explored to determine the interaction of the Base Commander and the Base Civil Engineering organization.

In addition to a review of regulations, Base Commanders were asked what they feel is their most important responsibility in facilities management. This information was gathered through telephone interviews, which will be addressed later in this chapter.

2. What information sources are available to prepare the new Commander for these responsibilities?

The majority of this information was identified by a review of the available literature as well as a review of course curriculum. The literature identified Air Force regulations, manuals, and pamphlets available to answer the Commanders' questions on facilities management. In addition, the curriculum of the Base Commander's Course and the Commanders' Engineering and Services Orientation Course was reviewed to identify types of material available to answer Commanders' questions. Unfortunately, the course materials would not necessarily be available to Base Commanders who have not attended either of the two courses.

Additional sources were identified by asking Base Commanders what sources they use for information on facilities management. This question was meant to identify any unique methods the Base Commanders have for getting answers to questions about facilities management.

3. What information do these sources give the Commander?

There were two sources available to address this question. The first source was a review of the course curricula materials of the Base Commander's Course and the Commanders' Engineering and Services Orientation Course. The second source was interviews conducted with the Base Commanders and a likely source of information for the Commanders, the Base Civil Engineers.

The first source, a review of the curricula materials of the Base Commander's Course and the Commanders' Engineering and Services Orientation Course, required the researcher to review and identify areas of information presented in the course handouts. The various areas of information were classified into categories. The curriculum was examined for three levels of pertinent information: general areas, specific topics, and first level of specific factual data. For example, the general area "facilities management" was investigated for such specific topics as "in-service work." These specific topics were further detailed to include "recurring maintenance, work orders, job orders, etc."

The second source was telephone interviews with Base Commanders and Base Civil Engineers. Base Commanders were asked to identify areas of facilities management in which they seek additional information, while Base Civil Engineers were asked what categories of information in facilities management the Base Commanders inquire about.

The answers were audio recorded (or handwritten, if the interviewee preferred not to be recorded) and later reviewed by the researcher. The researcher then categorized the answers into the three levels of pertinent information identified above.

4. What additional information not supplied by existing sources do experienced Commanders say they need to know about facilities management and civil engineering operations?

Telephone interviews were used to collect information about what other kinds of information on facilities management Base Commanders wish they had in an easier-to-access form. Two different populations were interviewed to collect information.

Interview Populations

The first population was current Base Commanders. Answers were sought for areas such as what sources they use to answer facilities management questions, what type of questions they ask these sources, what future problems their bases will face in facilities management, and what type of information they anticipate will be needed to address these problems.

The population was limited to lieutenant colonels and colonels serving at continental United States (CONUS) bases. The population was restricted to lieutenant colonels and colonels to ensure that experienced Commanders with the perspective of senior field grade officers were interviewed. The geographic limitation to CONUS-only bases served two purposes. First, the CONUS-only limitation ensured that the diversity of unique overseas problems did not dilute or distract from the common information problems faced by Base Commanders. The second reason for the CONUS limitation is the possible limitations in using the telephone system to conduct extensive interviews. Possible problems in the

areas of costs, telephone connections, time differences and sensitivity to unique political situations would hinder comprehension and comparison of answers.

The second population consisted of Base Civil Engineers. A natural source of information is the responsible agency, and for facilities management, that agency is civil engineering and the BCE. BCEs were asked about the frequency of requests from the BCC for information on facilities management. In addition, questions addressed what topics the BCC asks about and whether there exist differences in priorities or perspectives between the BCE and BCC. The questions on priorities and perspectives were meant to determine if a need existed for the sharing of information in a particular area of facilities management.

As in the case of base commanders, the selection of BCEs to interview was based on specific criteria. The population of Base Civil Engineers was limited to CONUS bases. Rank was not specifically limited, but the BCE position is usually restricted to individuals in the ranks of major through colonel. In addition to the other requirements, the BCEs interviewed had at least six months experience in the BCE job. This requirement was used to ensure the BCE had an experience base to draw upon in answering the questions.

Base Commanders. The selection of Base Commanders began with a search using the Military Personnel Center's

computers and the ATLAS data file program. The computer was directed to identify all Air Force officers who currently held the Duty Armed Forces Specialty Code (AFSC) of 0026 (Unit Commander) and who were stationed in the CONUS. The Duty AFSC 0026 is limited to lieutenant colonels and colonels. For these officers, the computer was directed to provide name, rank, duty address, duty phone, and to sort according to major command in which the Base Commander was assigned.

Since research is meant to identify the range and approximate extent of information needs of the Base Commanders and is not meant to be an exhaustive search or to precisely reflect the characteristics of the population from a sample, a rather small sample size would be adequate to identify the desired topics in facilities management of interest to Base Commanders. A relatively large sample size of 25 Base Commanders out of 79 was selected for the benefit of breadth and depth of topic coverage.

The Base Commander population was stratified into two groups based on major commands. The first group consisted of Base Commanders assigned to the three commands with the most bases under their control (MAC, SAC, or TAC). The second group consisted of Base Commanders from the other major commands (ATC, SPACECOM, AUN, etc.). The sample of 25 was selected such that 60 percent (15 Base Commanders) were selected from the group representing MAC/SAC/TAC while 40 percent (10 Base Commanders) were selected from the remaining

commands. Stratification by two groups of major commands was meant to ensure the sample reflected the proportion of the population represented by each of the major commands. The samples were randomly selected according to these criteria.

There are several reasons to stratify a sample. Two reasons for stratification of a random sample which Kish identifies were of importance in this case. Kish states that stratification increases statistical efficiency and it provides adequate data for analyzing various subpopulations (18:76-77). Emory states that "stratification is almost always more efficient statistically than random sampling and at worst is equal to it" (16:307).

Base Civil Engineer. The selection of Base Civil Engineer began with a search using the Military Personnel Center's computers and the ATLAS data file program. The computer was directed to identify all Air Force officers who currently hold either Duty AFSC A5516 (engineering supervisor) or A5596 (engineering director) and are stationed in the CONUS. The "A" designator ensures the commander (and Base Civil Engineer) of the civil engineering unit is selected. For these 79 officers, the computer was directed to provide name, rank, duty address, duty phone, and to sort according to major command in which the Base Civil Engineer was assigned. The population was stratified by major command and the sample of 25 Base Civil Engineers selected using the same criteria as stated above.

Initial contact with the interviewee was through an official letter. The letter (Appendix A) identified the interview's purpose as collecting information for the development of a facilities manager's manual. The letter stated that the manual would be for the Base Commander's use as a reference. The letter continued by asking for an interview, at a time convenient to the interviewee. The letter specified a range of time the interviewee's office would be contacted in order to establish a time for an interview. Enclosed with the letter was a definition of facilities management, as used in this research project, and a list of interview topics. A return address and AUTOVON telephone number was also included. The letter was sent between one to three weeks prior to the telephone call establishing the date and time of the interview.

Telephone Interviews

The interview process included selection of candidates and the telephone interview itself. The selection of interviewees involved identification of eligible candidates and the sample selection. The telephone interview was preceded by a written request for an interview (Appendices A and B) and a telephone call to establish a time for an interview, if the interviewee agreed to participate in the research.

The open-ended, structured telephone interview was selected over a mail survey because the interview allowed

qualitative responses, interviewer control, greater flexibility, and neutral probing (16:160-161). A structured interview ensured the necessary topics were covered and reduced bias since the same wording was used to ensure all respondents were asked the same questions (16:161). And finally, use of the telephone allowed more contacts in minimum time, minimization of travel expenses, an immediate response, as well as ensuring a very high response rate.

Research suggests some subjects who would not respond by mail may take the time to answer if confronted by an interviewer (25:289). Commanders who are confronted with many different written surveys may not respond. Very few negative responses were anticipated and all candidates were contacted. Only one respondent declined to participate, and was replaced by a randomly preselected alternative.

Some biases were eliminated through the telephone process (16:170). By using telephone contact, the respondent was less likely to read the interviewer's reactions, and this diminished the researcher's impact on the answers.

The length of the interview should not have been influenced by the use of the telephone. The use of government AUTOVON phone service reduced the cost of interviews when compared to commercial telephone rates.

Each respondent was asked if he or she would permit the recording of the interview for the researcher's review at a later time. If no objection was expressed, the recording began. If a respondent preferred not to be recorded, notes would have been taken after assuring the respondent that confidentiality would be ensured.

Interview Instruments. The interview instruments consisted of a list of interview questions (Appendices C and D). The question format ensured coverage of all topics with all interviewees. Base Commanders were asked to do the following:

1. Identify their sources of information about facilities management questions.

2. Identify information in the areas of facilities management they have discovered they need. Identify areas of facilities management in which they seek additional information.

3. Describe future facilities management problems they may be required to face at their bases. Predict the kinds of information they may need to address these problems.

4. Identify their most important responsibilities in facilities management.

5. Identify topics they would like included in a manual on facilities management, if one were to be prepared for them.

6. State whether they have attended either the Base Commander's Course or the Commanders' Engineering and Services Orientation Course, or both.

Base Civil Engineers were asked to do the following:

1. Identify the frequency per week of contacts between the Base Commander's office and the Civil Engineering unit concerning facilities management.

2. Identify categories of information in facilities management that the Base Commander inquires about (areas such as funding, job/work order status, etc).

3. Identify areas of differences in work priorities between Base Commanders and Base Civil Engineers, if any existed.

4. Describe Base Commander perspectives about facilities management which they have been exposed to since becoming a Base Civil Engineer.

5. Identify topics they feel should be included in a manual on facilities management, if one were written for their Base Commander.

Data Analysis

The researcher sorted the results of the interviews into categories. The sorting process matched the sorting process performed on the course curriculum--specifically, information was sorted into general areas, specific topics, and first level of specific factual data. General areas would include items like "people facilities." Specific topics would be areas like "MWR facilities," while specific factual data would include "funding methods for various MWR facilities."

In addition, determination of the Base Commander's course attendance was critical to categorization of the information. Established criteria depended on the course attendance or lack of attendance to determine which criteria would be applied to each respondent's answer.

Whether or not a topic should be included in the manual was determined by a set of criteria. Not all topics could or should be included in the manual. A sorting system,

explained below, was developed which would identify the materials which were most needed by Base Commanders. This system combined the needs with a priority system based on the needs of practicing Base Commanders. Factors were provided to include topics identified by graduates of Base Commander's courses, non-attendees, and topics identified by Base Civil Engineers who have been in a position to identify needed topics.

Accordingly, the following categories of materials were included in the manual:

Criterion 1: Any material covered in the Base Commander's course or the Commanders' Engineering and Services Orientation course curricula and reported by respondents who completed one/both of the course(s) as important.

Justification. Topics which were covered in the curriculum and identified by course graduates have been identified by two groups (writers/instructors and Base Commanders). Since the topic is important to both groups, it was included in the final list of topics.

Criterion 2: Also, any material not covered in the curriculum but identified by 25 or larger percent of the respondents who completed one/both of the course(s).

Justification. Material which is not in the course curriculum but is identified by a sizeable group (greater or equal to 25 percent) of those Base Commanders who have attended either one or both of the courses, was included. This classification may identify a shortcoming in curriculum or new material that should be included.

Criterion 3: Any topic identified by non-graduates of either course was included. Mention of such material indicates that these Base Commanders are unable to find it even if it is readily available. The material at least warrants a reference or an answer if it is not easily available in existing sources.

Criterion 4: Topics reported by Base Civil Engineers were compared with the material identified by the Base Commanders. Topics reported by 25 percent or more of the Base Civil Engineers and identified by any of the Base Commanders.

Justification. The last category, topics reported by 25 percent or more of the Base Civil Engineers and identified by any Base Commander were included in the selection list. A sizeable group of BCEs felt the topic was important and a Base Commander also identified the topic as important. If the topic is addressed in existing material, it should be referenced, and if it is not currently addressed, it was included in the list of topics to be included in the outline.

Topics identified in the interviews were compared with information available in the existing sources (regulations, manuals, pamphlets, and course curriculum). Material not covered in any existing resources was researched by the researcher and included according to the criteria identified above.

5. Where can this additional information be found and collected?

Topics identified by the interviews and sorted using the criteria specified in investigative question four, were

included in the outline. Topics that were identified as necessary for inclusion but not covered in existing sources were collected by the researcher using the resources of the Air Force Institute of Technology's School of Systems and Logistics, School of Civil Engineering and Services, School of Engineering, and the expertise of Air Force members and Department of Defense Civil Engineering employees. In addition, telephone interviews were conducted with experts at Headquarters USAF, as well as SAC, MAC, TAC, AFLC headquarters. Personal interviews were conducted with specialists at the 2750th (Wright-Patterson AFB) Civil Engineering squadron, MWR squadron, and Judge Advocate General's office. The depth of investigation was limited to "what information does the Base Commander need to know about this topic?"

6. How can this additional information be compiled into a book format useful to new Commanders?

A literature review of manual and book design methods (described in Chapter II) investigated the methods of presenting facilities management topics in a format that allows Base Commanders to reference this material. The latest research on document design was reviewed and criteria were identified for the presentation of topics considering concepts such as ease of use, attractiveness, presentation, cost of production, and ease of revision. The content of the manual was determined by the previous research steps.

IV. Analysis

Overview

This chapter presents and summarizes the results of data collected through telephone interviews of Base Commanders and Base Civil Engineers, as well as the research of additional sources of information to answer Investigative Questions two, three, four, and five.

The data is presented through Investigative Questions, beginning with number two. After the responses are presented and summarized, the results will be compared to the selected criteria stated in chapter three, which will identify topics which should be included in a reference manual for Base Commanders.

Finally, a description of the manual meeting the collective criteria of content, presentation, and format, is delineated.

Introduction

Investigative questions were answered by responses given to interview questions, combined with additional research of sources of information available to commanders. For the sake of exhaustive collection of opinions, respondents were allowed unlimited numbers of answers for each question. The goal was to identify as many essential topics as possible. Therefore, in some cases, the total number of responses exceeded the number of interviewees.

The single exception is the interview question which asked the Base Commanders to identify their most important responsibility in facilities management. In this case, a singular response was desired.

Selection criteria identified in chapter three were used to define material to be included in the manual. Meeting any one of the criteria meant inclusion in the list of topics to be included in the manual. Again, the criteria were:

- Any material covered in the Base Commander's course or the Commanders' Engineering and Services Orientation course curriculum and reported by any Base Commander respondent who completed one or both of the course(s) as important.

- Any material not covered in the curriculum, but identified by 25 percent or more of the respondents who completed one or both of the course(s).

- Any topic mentioned by non-attendees of either course.

- Topics reported by Base Civil Engineers were compared with the material identified by the Base Commanders. Topics reported by 25 percent or more of the Base Civil Engineers and identified by any of the Base Commanders.

Chapter three describes the methodology for collecting the responses and conducting the research. The results obtained by those method are discussed below.

Investigative Questions

Again, the purpose of this study is to determine the appropriate content of a reference manual for Base Commanders on facilities management. The investigative questions were essential in establishing a subtraction

process to identify topics which require research and explanation to add to the Commander's knowledge base. The first step was to identify what sources are available to prepare the new Commander for responsibilities in facilities management (Investigative Question number two). The next step was to identify what information current sources provide to prepare the new Commander (Investigative Question number three). Next, information was gathered to establish what the Commanders and the area expert (the Base Civil Engineer) say the Commander needs to know to prepare the Commander for the job (Base Commander Interview question numbers two and three, and Base Civil Engineer interview question number two). Then subtraction of the types of information the commanders get from current sources from what information the Commanders need to know identified topics that require more research or explanation (Investigative Question number four).

Investigative Questions were answered through interviews and additional research of information sources available to Base Commanders. Investigative Question two, three, four, and five are addressed individually, beginning with Investigative Question two.

Investigative Question Number Two

2. What information sources are available to prepare the new Commander for these responsibilities?

The Base Commander is provided guidance in the form of Air Force regulations, manuals, and pamphlets. Many of the regulations are based on public law. There are actually very few regulations covering facilities management which are specifically directed to the Base Commander. Most of the regulations are directed to the Civil Engineering organization under the direction of the BCC. Specific restrictions can be found in sections of several regulations for guidance on the use of funds for facilities. Unfortunately, the information is not provided in a collective source. Additional information is provided in update letters which come from Major Command headquarters on a regular basis.

The most specific guidance for the Base Commander in the area of facilities management is provided in Air Force pamphlet 84-14, entitled "Commander's Facility Improvement Guide." As the title states, it primarily addresses improvement of facilities, which ties in well with maintenance of facilities. This pamphlet emphasizes the need for a base comprehensive plan to provide priorities and guidance. In addition, the pamphlet identifies changes that can be made in existing facilities, as well as planning concepts for new facilities. AFP 84-14 briefly explains methods available to fund and direct improvements, and it provides reminders of limitations on facilities improvements (9).

Some additional references for guidance include:

AFM 88-43 (Installation Design), 1 Mar 81

AFM 88-15 (Air Force Design Manual), 8 Jan 75

AFP 88-40 (Sign Standards), 1 Apr 82

AFP 88-41 (Interior Design), 31 Oct 80

AFR 86-1 (Programming Civil Engineers Resources), 6 Aug 76

AFR 85-1 (Resources and Work Force Management), 21 May 82

None of these publications provide facilities management information in a format which is readily available to the Base Commander. It is likely the Commander would contact someone whose duties would require a closer knowledge of the contents of these publications--most likely someone in the Civil Engineering unit.

Additional general information is provided in two other handouts available to Commanders. The first is titled "The Air Force Installation Restoration Program." This guide provides a background on the Installation Restoration Program (IRP). The handout explains the outdated, four-phase IRP program. The remaining information on structure and funding of the program, and most importantly, the installation Commander's role in the program remain current. However, the information is general in nature and with only seven pages in length, it cannot address all the concerns of the BCC (7).

Another useful guide is the "Commander's Environmental Guide," which was prepared by the Air Force Regional Civil Engineer from the Central Region in Dallas, Texas. This guide provides an overview of environmental protection laws that U.S. Air Force installations must observe. The information is general in nature, and the brief handout is only three pages in length (2). The impact of new environmental laws at both the federal and state level make the publishing and updating of guidance a very difficult task.

Besides the regulations directed more towards the Civil Engineering squadron, and the limited information in the manuals and pamphlets, there are not many sources available which explain the responsibilities of the BCC in facilities management. Most Commanders learn while performing the BCC's job (28). This learning experience may be more difficult for the new BCC who has not had much facilities management experience, such as a rated officer recently out of the cockpit.

There are no published papers detailing the responsibilities or sharing the experiences of BCCs. There is no clear statement of what makes a successful, or an excellent BCC, such as has been attempted for the BCE (19:55).

The best educational experience available for a Base Commander is provided in either the Base Commander's Course

taught at Maxwell AFB, or the Commanders' Engineering and Services Orientation Course taught at Wright-Patterson AFB. Both courses provide an outline covering topics in the Engineering and Services area. The courses are not mandatory, and only about one third of the BCCs attend, and therefore, receive the handouts (28).

Most of the manuals, pamphlets and general regulations are not apparent to Base Commanders and in many cases, not convenient for their use. This fact is identified by responses given by the Base Commanders to interview question number one, which asked "When you, as a manager have a question about facilities problems, where do you go to get the information you need to solve it?"

The vast majority of the respondents identified civil engineering or the Base Civil Engineer as their source of information for facilities management problems. Other subareas of civil engineering, such as real property or community planning, were also mentioned as sources for specific answers to facilities questions. For special or unique facilities problems, the Commander may seek the assistance of other agencies outside of civil engineering. The results are shown in Table 4.1.

TABLE 4.1

Base Commander's Question Number One

When you, as a manager have a question about facilities problems, where do you go to get information you need to solve it?

Source	Count
BCE/CE	24
Real Property (CE)	4
Community Planning (CE)	1
Construction/Design Briefing (CE)	1
Facility Utilization Board	5
Building Manager	3
Contracting	2
Comptroller	1
Base Procurement	1
Finance	1

Additional research indicates there are other sources of information available to Base Commanders. Many of these sources are not considered convenient or available to all respondents. A manual could incorporate these sources, or at least identify them as feasible sources of information. Possible sources of information for Base Commanders include the sources shown in Table 4.2

TABLE 4.2

Sources of Information for Base Commanders

AFIT's Engineering and Services Orientation Course-curriculum
AU's Base Commander's Course-curriculum
Air Force/Department of Defense (DOD) Regulations
DTIC-books, papers, theses
Journal Articles
Briefings (Professional, staff, etc.)
Faculty of AFIT's School of Civil Engineering and Services
Air Force Engineering and Services Center (AFESC)
Deputy Chief of Services (DCS)-MAJCOM's pamphlets/conferences
Air Force Regional Civil Engineer (AFRCE) - pamphlets
Special publications of AF and other government agencies

The course curricula appear to be the only collections of information about various topics in facilities management. Six of nine Base Commanders who attended the Wright-Patterson Commanders' Engineering and Services Orientation Course found this course to be very useful. In addition, four more Commanders planned to go to the Commanders' Engineering and Services Orientation Course because they heard good comments about the course and its content. The curriculum from the Base Commander's Course has the same written material which is presented in the Commanders' Engineering and Services Orientation Course, but the material is presented in a shorter instruction period. Therefore, it is not covered in as much detail. The longer instruction period allows greater flexibility in the presentation of material, allowing Commander's questions to be more thoroughly addressed (4; 28).

The next step in the identification of manual topics is to identify what information is provided by current sources to prepare new Commanders for their responsibilities in facilities management. Investigative Question three fulfilled this need.

Investigative Question Number Three

3. What information do these sources (sources to prepare new Commander) give the Commander?

This investigative question was also answered through interview questions and additional research. The information currently available to Base Commanders was identified

by asking them to specify topics they request information on. Also, a review and categorization of topics covered in the two course curricula for Commanders was completed.

Interviews. Input from both Base Commanders and Base Civil Engineers was used to answer this investigative question. The second question of the BCC interview asked, "What categories of information have you discovered you need?" The interviewee was asked to explain what categories of information, and in particular, what topics he or she had questions on in the past. It appears the responses reflect the types of problems and questions that commanders have faced recently in fulfilling their duties. In particular, the area of funding and financial management has consumed much of their time due to recent funding cutbacks. Of course, limited resources such as funding are always a constraint when dealing with the diverse needs of a base.

Commanders expressed a desire to better understand the processes involved in seeking approval for the various classes of work completed by the civil engineering organization. This item may reflect another issue commanders say they are frequently asked to address: "When will my project be started/completed." Many customers and commanders express frustration with the process and timeline required to get work accomplished within the CE organization. Commanders felt a desire to understand the process, and perhaps address any delays that various projects face. Various other

categories of information have been sought by experienced commanders. The responses are shown in Table 4.3.

TABLE 4.3

Base Commander's Question Number Two

What categories of information have you discovered you need?

Categories of Information	Count
Funding/Financial Management	10
Work Approval	5
Comprehensive Planning/Real Property Siting	5
Mission Changes-Impacts	3
Infrastructure/Utilities/HVAC	2
Housing	2
Status of Projects	1
People programs-MWR facilities	1
Environmental-liability	1
CE/Contracting Interface	1
Energy Conservation	1

Base Civil engineers were asked to identify categories of information Base Commanders most often seek. Since a large majority of Base Commanders identified the Base Civil Engineer in particular and civil engineering in general as their source of information, it is reasonable to seek this input. Base Civil Engineers were able to identify a full range of topics about which BCC questions arose. The BCEs were not reluctant to identify areas from which Base Commanders asked facilities management questions. The Base Civil Engineers were asked, "In your experience, what categories of information in facilities management does a Base Commander most often need?" The BCE's responses are summarized in Table 4.4.

TABLE 4.4

Base Civil Engineer Interview Question Number Two

In your experience, what categories of information in facilities management does a Base Commander most often need?

Categories of Information	Count
Status of Work/Project	17
Base Appearance	7
Infrastructure/Utilities/HVAC	4
Command Interest Items/Issues	3
Information from MAJCOM/Outside Sources	1
Comprehensive Planning	1

BCE responses indicate that the majority of inquiries relate to immediate concerns. Questions are most likely about the status of current projects, base appearance, or other issues of interest to the Base Commander's supervisor.

BCEs said that most frequently the BCC asks about the status of particular projects. Additionally, commanders ask about items that affect the appearance of the base. Civil engineers stated that this inquiry is frequently initiated higher in the base chain of command. The question may involve, "why is CE digging around building 24?" The connection between a certain job or work order which the commander was briefed, and the digging which has begun, may not be apparent, due to various reasons. Usually this type of inquiry can be answered quickly, is site specific, and would not best be served by the inclusion of any additional material in a manual.

BCEs expressed the fact that they are responsible for ensuring that the infrastructure and utilities of the base are well maintained. BCEs stated that there is pressure to assign resources (funds), to areas and jobs which are visible. The need for maintenance of steam systems and roofs is not apparent, until they fail, and then the repair is more costly than the maintenance of the system. The technical nature of these systems makes them less obvious to people outside CE, who are tasked with the up-keep of these systems. Civil engineers said they are frequently asked by commanders why this infrastructure is so important and if it can be delayed.

Curriculum Review. The categories of information presented in both the Base Commander's course and the Commanders' Orientation course are identical. The area of facilities management is taught at both schools by the faculty of the Air Force Institute of Technology's School of Civil Engineering and Services, with the exception of a field trip to the readiness training course at Eglin AFB FL. The curriculum presented in class at the Base Commander's course is somewhat restricted by the time limit of three days for both Civil Engineering and Services. The material not presented in class is included in the course manual available to each Base Commander. The course material is presented in outline format, with bullet statements and few details. White space is provided for notetaking. Categories of information and their topics included in the

curriculum are presented in Table 4.5. The categories of information are presented in boldface type.

TABLE 4.5

Categories of Information Presented in the Commanders' Engineering and Services Orientation Course and the Base Commander's Course

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Civil Engineering Readiness
- Structure of Prime Beef Contingency Support
  - -- Mission
  - -- Prime Beef Teams
  - -- Red Horse
  - -- Civilians
- Wartime Tasks of Prime Beef Teams and Training to Accomplish those Wartime Tasks
  - -- Force Beddown
  - -- Air Base Operability
  - -- Base Recovery
  - -- Current Training
  - -- How Training Requirements Impact Base Operations
  - -- Goal: Realistic Training and Exercises
- Capabilities and Limitations of Prime Beef Teams

Customer Service
- What is "Good" Customer Service?
- The CE Image
- A Model of Customer Service

In-Service Work
- Work Accomplishment
  - -- Work Categories (In-House):
    Maintenance and Repair Job Orders
    Maintenance and Repair Work Orders
    Minor Construction Job Orders and Work Orders
    Recurring Work Program
- Controlling the Backlog
  - -- Installation Priorities
  - -- Programming/Scheduling to Meet the Commander's Needs
  - -- Allocation Programs/Systems
  - -- Self Help
- Quality of Work
  - -- Customer Feedback
  - -- Foreman and Superintendent Role
  - -- Commander's Role

TABLE 4.5 (Cont'd)

Categories of Information Presented in the Commanders' Engineering and Services Orientation Course and the Base Commander's Course

Requirements and Programming Avenues
- Requirements
  -- Requirements Definitions
  -- Reasons for Work Plan Development
  -- Work Plan Development-What Generates Our Work Load?
  -- Work Programming Criteria
  -- Work Approval and/or Validation
- Programming Avenues
  -- Definition
  -- Rules of Programming (Approval Authority)
  -- Project Funding Avenues

Environmental Planning Overview
- Responsibility of BCE and Installation Commander
- Responsibility of the Environmental Planning Function
- Environmental Planning Programs
  -- Environmental Protection
  -- Environmental Impact Analysis
  -- Natural Resources
  -- Comprehensive Planning
- Base Wide Involvement
  -- Environmental Protection Committee (EPC)
  -- Costs of Non-Compliance
  -- Hazardous Materials Management/Waste Minimization
  -- Individual's Responsibility
- Future Challenges
  -- Resource Limitations
  -- Stringent Guidelines
  -- Industry Challenged
  -- Personnel Restrictions

Military Construction Programming
- Statutes and Regulations
  -- Military Construction Projects
  -- Emergency Construction
  -- Contingency Construction
  -- Administration
  -- Regulations
- Approval Criteria (Attributes)
  -- Authority and Dollar Limits
- Provisions for Initiating Military Construction Program Projects
  -- Permitted
  -- Not Permitted

TABLE 4.5 (Cont'd)

Categories of Information Presented in the Commanders' Engineering and Services Orientation Course and the Base Commander's Course

- Concerns
  -- Age of Physical Plant
  -- Inadequate Documentation/Justification
  -- Length of Process
  -- Congressional Adds
- MCP Program Process
  -- Basic Purpose and Grouping of MILCON
  -- MCP Cycle
  -- MCP Interface with PPBS
- MCP Documentation
  -- Annual Call Letters
  -- Initial Program Submittal
  -- Final Program Submittal
- Problems
  -- DD Form 1391
  -- Existing Facilities/Deficiency Detail Data Sheet
  -- Project Deferrals, Denials (Reasons)
  -- Project Books
  -- Understanding Roles of Key Players
  -- Gramm-Rudman

Fire Protection Management
- Fire Protection Management Checklist
- Commander's Fire Protection Checklist

Financial Management
- How Funds are Distributed and Accounted For
  -- Types (Pots) of Money
  -- Major Force Programs (MFPs)
  -- Program Element Codes
  -- Responsibility Centers
  -- Cost Centers
  -- Elements of Expense Investment Codes (EEIC)
- DOD Planning-Programming-Budgeting System (PPBS)
  -- Definitions/Purpose
  -- What Happens in Each Phase
- CE Administers Typically 40-60% of the Base's Budget
  -- Direct Expenses
  -- Reimbursements and Refunds
- The Money Cycle at Base Level
  -- Forecasting
  -- Justification
  -- Submitting
  -- Allocating

TABLE 4.5 (Cont'd)

Categories of Information Presented in the
Commanders' Engineering and Services Orientation Course
and the Base Commander's Course

-- Spending
-- Accounting
-- Controlling
-- Financial Management
-- Adjustments

Corp of Engineers/Air Force Interface

Military Family Housing
- Requirement (Deficits)
- Correcting Our Deficits
- Family Housing MGT Branch (Structure & Responsibilities)
- Waiting Lists
- Occupancy Rates
- What Constitutes Adequacy?
- Funds and Costs
- Restrictive Sanctions and Commander's Involvement
- Cleaning and Inspection
- General Officers Quarters Management
- Fire Protection

Commander's Update Briefing
- Update Briefing
  -- Who Should Attend?
  -- How Often to Meet?
  -- Where to Meet?
  -- When to Meet?
  -- What to Talk About?
- CE Management Indicators
  -- Operational Readiness
  -- Resources
  -- CE Work
  -- Special Interest
- Sources of Engineering Assistance
  -- Technical/Specialty Teams
  -- Professional Continuing Education and Training

Air Force Inspector General
- Current Topics of Interest

TABLE 4.5 (Cont'd)

Categories of Information Presented in the Commanders' Engineering and Services Orientation Course and the Base Commander's Course

Comprehensive Planning
- What Constitutes Comprehensive Planning
- Why Comprehensive Plans are Necessary
- Responsibilities
- Implementation-The Key
- Concerns
- Elements of the Base Comprehensive Plan

Shop Rates
- The Reimbursement Process

Hazardous Waste Management
- Environmental Compliance
- Legislative and Regulatory Basis
- Installation Hazardous Material/Hazardous Waste
- Inspections, Surveys, and Audits
- Personnel Education and Training
- Commander's Liability

Real Property Management
- Real Property Definitions
- Granting Temporary Use of Real Property
- Use of Real Property

Architect-Engineer Services (A-Es)
- Why A-E Services
- Types of A-E Services
- Statutory Limitation of Fee
- Publicizing Contract Actions
- Selection Process
- Open-End Contracts
- Contract Negotiation and Administration Procedures
- Performance Evaluation Report
- Types of A-E Services
- Problems/Concerns

Asbestos Program
- What is Asbestos?
- Health Hazards
- Compliance with Regulations
- Protective Measures
- Air Force Program

TABLE 4.5 (Cont'd)

Categories of Information Presented in the Commanders' Engineering and Services Orientation Course and the Base Commander's Course

Energy Management
- Goals and Process
- Energy Security
- Project Priorities
- Conservation through O&M
- Financing Energy Projects
- Building Energy Technical Surveys
- Metering
- AF Energy Program Policy Memoranda

Managing General Officer Quarters
- Purpose of Reports
- Guidance
- General Officer Quarters Cost Report
- DD Form 2405, General or Flag Officer Quarters Management Report
- AF Form XXXX, Analysis-General Officer Quarters
- Housing Officer Responsibilities
- BCE Financial Manager Responsibilities

Quality Assurance Evaluation (QAE) - Service Contracts
- AQE Program
- Quality Assurance Surveillance Plans
- Random Sampling
- Surveillance
- Deductions for Unacceptable Performance

Contracting and CE
- Interface

Air Field Pavement Management
- Importance of Pavement Systems
- Factors Causing Distress in Pavement Systems
- CE Responsibilities
- Paver
- Project Management

Current Topics
- SAC "ROOM" Reorganization of CE
- Planning Assistance Team (PAT) Visits

At this point, the information that Base Commanders need to know to prepare for the job has been identified (Tables 4.3 and 4.4). Also, the information that Commanders have available to them has been identified (Table 4.5). Subtracting what Commanders get from their information sources from what information the Commander needs, identifies areas that require more research or explanation. Additionally, Base Commanders were asked to identify information they will need to face future problems. Investigative Question number four and Base Commander interview question number three identify this material.

Investigative Question Number Four

4. What additional information not supplied by existing sources do experienced Commanders say they need to know about facilities management and civil engineering operations?

The purpose of the research is to identify the information needs of the Base Commanders. The commanders may not be aware of all possible sources providing the information they may need. But from their needs, the researcher can seek the additional sources and research to fill the need of the Commanders. Then, the information could be collected and presented in a format useful to the Base Commanders.

The initial step of identifying the current needs of the Commanders is complete. The next step is to ask the Commanders to project into the future and speculate on

problems they may face, and if possible, identify information needs addressing these future problems. While merely identifying the types of problems the Commanders may face at their bases may be enough information for the researcher to recognize information needs, the Commanders were asked to identify the kinds of information they may need.

Base Commander interview question number three asked, "As you look toward the future, what kinds of information will you need?" A summary of the responses is shown in Table 4.6.

TABLE 4.6

Base Commander Interview Question Number Three

As you look towards the future, what kinds of information will you need?

Kinds of Information	Count
Funding Cutbacks - alternative actions	11
Infrastructure/Utilities	8
Comprehensive Planning	7
Mission Change - facilities, space allocation	4
MILCON - funds, lead time, approval	4
Contracting - process, funding, predesign	3
Asbestos	2
Base Appearance	2
Energy Conservation	1
Environmental	1

Base Commanders were very concerned with the impact of recent cutbacks in Operations and Maintenance funds. The Commanders expressed concern that these cutbacks will continue into the foreseeable future and change the way in which bases operate. The collective concern was with finding

alternatives to current methods of operating. Commanders felt a better understanding of the categories of funds available, and the intricacies of using these funds, could enable them to identify alternative methods of funding base activities. Creative yet legal alternatives were the desired suggestions.

Seventeen of nineteen Commanders who mentioned funding cutbacks and infrastructures (Table 4.6) expressed fears that funds would be taken from repair and maintenance to fill the vacuum in operations. The commanders are concerned with giving the appropriate funding to the infrastructure and utilities, while funding other base operations.

Seven of twenty-five Commanders were tasked with preparing for major mission changes at their bases. The incorporation of new weapons systems such as the B-1 bomber, projected B-2 bomber, rail garrison or midget man missiles and other aircraft changeovers, requires extensive reevaluation of facilities capabilities and limitations. Each base is unique in its assets, but Commanders expressed concern about identifying all the impacts of new missions on their facility needs. The long acquisition process for major facilities requires long-term planning to begin facilities development early enough to ensure the timely completion of support facilities.

Investigative Question Number Five

5. Where can this additional information be found?

Research indicates this additional information can be found in the sources indicated in Table 4.7. The next step was to find the information on the topics indicated by the Base Commanders and present it in a usable format.

TABLE 4.7

Additional Sources

1. Curriculum
2. Air Force/Department of Defense Regulations
3. Statutes
4. Air Force Pamphlets
5. Publications from Major Commands (MAJCOMs)
6. AFIT School of Civil Engineering and Services staff/faculty

Topics such as Comprehensive Planning, Military Construction Program, Contracting, Asbestos, Energy Conservation, and Environmental may be found in curriculums of courses taught at the Air Force Institute of Technology's School of Civil Engineering and Services. Topics such as Funding Cutbacks, Mission Changes, and Infrastructure may be researched through a combination of the Commander's Course curriculums and discussions with the faculty of the School of Civil Engineering and Services. Air Force pamphlets, MAJCOM publications, and statutes can be reviewed for materials on each of the topics.

Compare Findings to Criteria to Identify Topics

To identify topics to be included in the manual, the topics identified as important by Base Commanders and Base

Civil Engineers were compared with the selection criteria identified earlier. Topics meeting any one of the criteria were included in the manual.

The First Criterion. The first criterion gathered, "any material covered in the Base Commander's course or the Commanders' Engineering and Services Orientation course curricula and reported by respondents who completed one/ both of the Course(s) as important." This statement involved any curriculum topics identified by Base Commanders who have attended either or both courses, and provided answers to either interview question two, three, or five. The sorting process identified the topics which appear in Table 4.8.

TABLE 4.8

First Criterion

Any material covered in the Base Commander's course or the Commanders' Engineering and Services Orientation course curriculums and reported as important by respondents who completed one/both of the course(s).

Topic	Count
Financial Management	14
Comprehensive Planning	9
Infrastructure/Utilities - airfield pavements	8
In-Service Work	5
Environmental	4
Asbestos	3
Contracting - A-E services, CE/contracting interface	3
Military Construction Program	2
Energy Management	2
Family Housing - including General Officer	2

The Second Criterion. The second criterion involved "any material not covered in the curriculum but identified

by 25 or larger percent of the respondents who completed one/both of the course(s)." First, the material suggested by Base Commanders which is not covered in the course curriculum was identified. Next, the restriction of being identified by 25 percent of the Base Commanders was applied to this material.

The 25 percent cut off was defined by taking 25 percent of the number of Base Commanders interviewed (twenty-five), and finding the cut off at 6.25 responses. Since the research is dealing with a nominal scale, and it is undesirable to eliminate any response meeting the criterion, the cut off was rounded down to six or more responses.

The recommended non-curriculum materials are identified in Table 4.9.

TABLE 4.9

Second Criterion

Material which is not in the course curriculum but identified by 25 or larger percent of the respondents who completed one/both of the course(s).

Topic	Count
People/Facility Programs - MWR	** 6 **
Impacts of Mission Changes	5
Summarize Commanders' Engineering and Services Course	3
CE Squadron - make-up, mission, operations	3
Limitations - statutory	2
Base Appearance	2
Status of Projects	1
Experiences - practical	1
Define Air Force Averages - for a typical base	1
Key Telephone Numbers	1

** Cutoff includes count of six or more

Only one topic qualified when applying the cut off restriction of six minimum recommendations was applied--"People/Facility Programs - Morale, Welfare, and Recreation." Concern for people programs which tie closely to facilities, in particular MWR programs, was mentioned more times than any other item not currently presented in the course curriculum. The concern for MWR is tied to the Congressionally mandated removal of many MWR facilities from appropriated funds support, effective 1 October 1988. Impacts will be felt in areas such as golf courses, clubs, bowling alleys and other facilities that are considered to be in competition with off-base businesses. The removal of appropriated funds means these facilities must be self-supporting, and the facilities have very little time to make such as turnaround. Some Commanders felt the deadline for removal of appropriated funds is too close for these facilities to make a successful transition.

The Third Criterion. The third criterion includes in the outline, "any topic mentioned by non-attendees of either course." Any categories of information identified by Commanders who have not attended either the Base Commander's Course, or the Commanders' Engineering and Services Orientation Course, will automatically be included in the outline. At present these commanders must find their own sources of information. Topics they mention are likely to be topics they were unable to find sources for or do not

have the time or resources to research. Therefore, these topics are of high importance for inclusion in a reference manual. The topics identified by this group are presented in Table 4.10. Many of the topics identified by this group were also identified by other groups as important enough to warrant inclusion in a reference manual.

TABLE 4.10

Third Criterion

Any topic mentioned by course non-attendees

Topics	Count
Funding/Financial Management	4
In-Service Work/Requirements and Programming	2
Comprehensive Planning	2
Family Housing	2
Contracting	2
Limitations - statutory	2
Implementing Mission Changes	1
Infrastructure/Utilities	1

The Fourth Criterion. The final criteria for inclusion in the outline is, "Topics reported by 25 percent or more of the Base Civil Engineers and identified by any of the Base Commanders." Again, Base Civil Engineers are important sources for Base Commanders when it comes to facilities management problems. So, the first step was to identify topics which the Base Civil Engineers felt were important enough to include in a manual for Base Commanders. The suggestions of Base Civil Engineers are presented in Table 4.11.

BCEs suggested many topics for inclusion in a reference manual. Again the impact of current funding cutbacks was the most frequently mentioned topic, Funding/Financial Management. Other topics reflected concern for a smooth working relationship between the Base Commander's office and civil engineering. BCEs felt that if the BCC clearly understood the mission and functions of civil engineering the disagreements over "is that CE's responsibility or not" could be avoided without the frequent friction which occurs between base agencies. In addition, the BCEs felt the relationship between the BCE and BCC was of great importance to the success of civil engineering and the Base Commander. The BCEs felt their availability as a consultant to the Base Commander was very important, and that a good working relationship would greatly enhance the base's operation.

TABLE 4.11

Topics Recommended by Base Civil Engineers

Topic	Count
Funding/Financial Management	13
CE Squadron	7
In-Service Work/Requirements and Programming	6
Infrastructure/Utilities	6
Approval Level Authority	6
Limitations - statutory	5
Relationship BCC/BCE	5
Family Housing	2
Environmental	2
Summarize WP Commander's Orientation Course	2
Fire Protection	2
Commander's Update Briefing	2
Energy Conservation	1
Key Telephone Numbers	1
Equipment Versus Real Property	1

Many of the other topics mentioned reflected the engineer's concern for a balanced set of priorities for the base. The Engineers recognized that the Base Commander is instrumental in setting the priorities for base assets in facilities management. The BCEs felt that awareness on the part of the Base commander to include these particular topics, would help ensure a balanced facilities management program. A balanced program was identified by both groups as important to a base's long-term survival and success.

The next step in the screening process is to select from these topics, items recommended by 25 percent or more of the BCEs. With 25 Base Civil Engineers (the same number as Base commanders used in a previous selection process), 25 percent of this amount again equates to 6.25 responses. Using the identical reasoning as was used in the case of Base Commanders, six or more recommendations are necessary to meet the 25 percent restriction.

Finally, the topics to be included in a reference manual under this criterion must also be recommended by at least one Base Commander. When this factor is applied, the selected topics are as shown in Table 4.12.

TABLE 4.12

Fourth Criterion

Topics	Count
Funding/Financial Management	13
CE Squadron	7
In-Service Work/Requirements and Programming	6
Infrastructure/Utilities	6
Approval Level Authority	6

The five topics to be included from this selection process include: Funding/Financial Management, the Civil Engineering Squadron itself, Types of Work and the steps necessary in coordinating approval, Base Infrastructure and Utilities, and Approval Level Authority for key facilities managers.

Topics for Inclusion in the Manual

The final list of categories of information to be included in a reference manual is shown in Table 4.13.

TABLE 4.13

Topics to be Included in the Manual

Funding/Financial Management
Comprehensive Planning/Base Comprehensive Planning
Infrastructure/Utilities
Approval Level Authority
In-Service Work
Requirements and Programming
Environmental Planning
Asbestos
Military Construction Program
Energy Management
Contracting - CE/Contracting Interface, A-E Service Contracts
Family Housing (including General Officer Housing)
People/Facilities Programs - MWR
Limitations - statutory/legal
Implementing Mission changes
Civil Engineering Squadron (make-up, mission, operation)

Additional insight into how these 16 items can best be presented is shown below.

A Manual Which Meets the Criteria

A useful manual should possess two key characteristics: 1) Presentation of important information; and 2) Presentation

of information in a user-friendly, convenient format (21:6-9). This portion of the chapter explains how these two characteristics can be incorporated in a manual which meets the needs of Base Commanders, as defined by Base Commanders and Base Civil Engineers.

Characteristics of a Useful Manual

The first characteristic of the manual should be the inclusion of important information. The purpose of establishing criteria for the selection of topics to be included in the manual was to ensure the needs of Base commanders were met. By interviewing experienced BCCs and BCEs, and comparing their inputs with predetermined criteria, it is felt that important information for Base Commanders was identified. These topics have been defined and are shown in Table 4.13.

The second characteristic of a useful manual deals with presentation of the information. In addition to topics to be included in the manual, several interviewees suggested methods of presentation they felt were important to "user friendliness," and thus the success of the manual. These inputs came from the people in the best position to judge a manual's usefulness, Base commanders and Base Civil Engineers. The Base commander's suggestions are presented in Table 4.14.

TABLE 4.14

Base Commanders' Format Recommendations

BCC'S Comments	Count
Brief/Concise	5
Able to be updated	3
Include checklists	2
Relate to Mission Commander, in addition to BCC	1
Comprehensive	1

Base Commanders' Format Recommendations. Base Commanders believe their time is very important, and they feel any manual they are likely to use must be brief and concise. Their recommendations included using bullet statements, outlines, and checklists, if possible.

Base Commanders recognized the time sensitivity of a manual due to changes in regulations, financial situations, and priorities. They felt any manual produced must somehow be able to be updated.

Base Civil Engineers' Format Recommendations. Base Civil Engineers also felt a desire to suggest useful methods of presentation. Their inputs are shown in Table 4.15. Base Civil Engineers also recommended a brief, concise format. One BCE explained that at his level and above, supervisors suffer information overload. He explained they have too many inputs, and reading is one of their most time-intensive activities. A useful manual to like-minded individuals would be concise.

TABLE 4.15

Base Civil Engineers' Format Recommendations

BCE's Recommendations	Count
Brief/Concise	7
Briefing format is preferred	3
Summarize Commanders' Engineering and Services Orientation Course	2
Checklist format	1
Fill-in-the-blanks format for local budget/phone numbers, etc.	1
Write it for the Installation CC also	1

Three BCEs felt so strongly about reading being time intensive, that they stated they prefer the information in briefing format. They were not asked, nor did they explain, whether they would like the material presented in talking paper format. In this case, civil engineering could present the material to Base Commanders from time to time.

Two BCEs stated they like the information presented to Base Commanders at the Commanders' Engineering and Services Orientation course. They explained that the material given to Base Commanders at that course is very good, but overwhelming. They believe the curriculum would make a good manual, if it were condensed or summarized.

Other recommendations included formats for specific materials. An example is a fill-in-the-blanks format for information that varies from base to base, but is important enough to warrant the BCCs awareness. A specific case would be Approval Level Authority for key personnel at the MAJCOM,

and at the base. BCEs explained that this format would serve as a memory jogger or awareness device for the Base Commander.

Another BCE recommended the manual be written for Installation Commanders and not just for Base Commanders. At many bases, the Installation Commander is more involved in facilities management than the Combat Support Group Commander, due to assignment of responsibilities or organizational design.

Format Recommendations from the Literature. Format concepts were discussed in chapter two. Several key points warrant repeating.

1. Overviews should: stress key points, preview structure, related material.
2. Summaries, glossary of terms, and detailed indexes speed up access to information.
3. Informative headings help organize and describe material.
4. A table of contents is especially useful in a reference manual.
5. Pagination by chapter simplifies page changes at a later date.

Some useful typographic principles:

1. Some useful highlight techniques include underlining, boldface, and the use of white space.
2. A ragged right margin is easier to read.
3. Some useful illustrations include bar charts, tables, and graphs.

No One Perfect Manual

Various topics, presentations and formats could assist the Commander in exploring all necessary directions of a facilities management problem. The author realizes that no

one manual can fulfill the needs of all commanders in every situation. That was not the goal of the suggested outline constructed by applying this research. It is felt the investigation into the desires and needs of a sizeable number of Base Commanders and their key staff member, the Base Civil Engineer, will identify information important to Base Commanders in providing for the needs of a base, and its personnel, within the continental United States.

An outline on facilities management which applies the criteria identified in this research is presented in Table 4.16.

TABLE 4.16

Outline for a Base Commander's Manual for Facilities Management

I. Section A: Base Civil Engineering Organization

- A. Civil Enginering Mission
- B. Basic Organization of a CE Squadron by Branch
- C. Interrelationship of Base Civil Engineer and Base Commander

II. Section B: In-Service Work

- A. Work Accomplishment
- B. Controlling the Work Backlog
- C. Ensuring Quality of Work

III. Section C: Civil Engineering and Contracting

- A. CE/Contracting Interface at Base Level
- B. Types of Contracts
- C. Construction and Architect-Engineer Contracts
- D. Service Contracting
- E. Recourse Against Unsatisfactory Contractors

TABLE 4.16 (Cont'd)

Outline for a Base Commander's Manual for Facilities Management

IV. Section D: Requirements and Programming

- A. Requirements Overview
  - 1. Background Information
  - 2. Work Plan Development
  - 3. Classification of Work
- B. Programming
  - 1. Definitions
  - 2. Rules of Programming
  - 3. Project Funding Avenues

V. Section E: Approval Authority

- A. Approval Authority
- B. Delegation of Authority
- C. Major Parties Involved in Approval Authority
- D. Charts and Examples

VI. Section F: Financial Management

- A. How Funds are Distributed and Accounted For
- B. How CE Administers Budget
- C. The Money Cycle at Base Level

VII. Section G: The Military Construction Program

- A. Statutes and Regulations
- B. MILCON Program Process
- C. Problems with MILCON Process
- D. Regulations

VIII. Section H: Comprehensive Planning

- A. What Constitutes Comprehensive Planning
- B. Why Comprehensive Plans are Necessary
- C. Responsibilities
- D. Implementation - The Key
- E. Concerns
- F. Elements of the Base Comprehensive Plan

TABLE 4.16 (Cont'd)

Outline for a Base Commander's Manual for Facilities Management

IX. Section I: Military Family Housing (MFH)

- A. USAF MFH Objectives
- B. Determining AF Requirements
- C. Correcting AF Deficit
- D. Base Supplement to AFR 90-1
- E. Redistribution and Redesignation
- F. What Constitutes Adequacy
- G. Funds and Costs
- H. Restrictive Sanctions
- I. General Officer Quarters (GOQ) Cost Reports

X. Section J: Environmental Planning Overview

- A. Introduction to AF Environmental Planning Programs
- B. Environmental Protection
- C. Environmental Impact Analysis
- D. Natural Resources Program
- E. Air Installation Compatible Use Zones
- F. Comprehensive Planning
- G. Environmental Protection committee (EPC)
- H. Environmental Law
- I. Selected Glossary

XI. Section K: Asbestos Management

- A. What is Asbestos
- B. Health Hazards
- C. Compliance with Regulations
- D. Protective Measures
- E. Air Force Program

XII. Section L: Facility Energy Management

- A. Goals and Progress
- B. Energy Security
- C. Project Priorities
- D. Conservation Through Operations and Maintenance
- E. Financing Energy Projects
- F. Building Energy Technical Surveys
- G. Metering
- H. Air Force Energy Program Memoranda (AFEPM)

TABLE 4.16 (Cont'd)

Outline for a Base Commander's Manual for Facilities Management

XIII. Section M: Infrastructure

- A. Background/Definition
- B. Infrastructure Evaluation Program
- C. Recommended Actions for Commanders

XIV. Section N: MWR Funding

- A. MWR Funding Categories
- B. Impact of Recent Changes

XV. Section O: Mission Changes

- A. Background
- B. New Missions
- C. Force Structure Changes
- D. Suggestions for Commanders

XVI. Section P: Statutory Limitations

- A. Background
- B. Contract Law
- C. Environmental Law
- D. Military Family Housing Limitations

V. Recommendations

Overview

This chapter presents recommendations for the development and use of a reference manual which could serve as a comprehensive, self-contained aid for the study of facilities management, and recommendations for further research.

The manual would not replace the two courses available for Base Commanders and Deputy Base Commanders. It would serve as a reference manual for experienced commanders, as well as an orientation for new commanders.

Recommendations

1. The outline should be developed into a reference manual for distribution and use by new and experienced Base Commanders and Deputy Base Commanders. The topics and sources of information have been identified by this research. It becomes a matter of expansion and development to explain the topics in an appropriate manner, which applies the principles identified in this study. The breadth of information is known. Now the development process requires investigation into the depth of coverage necessary to meet Base Commanders' needs for each topic identified.

2. The many topics which comprise facilities management are dynamic and may be affected with rules, laws, and policy changes. It is recommended that an agency such as

the Air Force Institute of Technology's School of Civil Engineering and Services, or the Air Force Engineering and Services Center assume responsibility for administering and updating any manual which is developed.

The manual could be entered and maintained in the Work Information Management System (WIMS). When changes are necessary, the file can be updated and distributed in disk format to base Civil Engineering Squadrons and AFIT for printout and distribution. Another method of updating the manual would involve the transfer of the new file over communications lines using an electronic transfer system. This last method is as simple and fast as a telephone call. A centralized control point, with access to current procedures and practices would be important to the success of such a system.

3. The Air Force Institute of Technology's School of Civil Engineering and Services could consider the reproduction and distribution of a manual to all attendees of the Commanders' Engineering and Services Orientation Course at Wright-Patterson AFB OH, and the Base Commander's Course at Maxwell AFB AL. The course director of the Commanders' Engineering and Services Orientation Course, Major Larry J. Blake, has stated that "the manual could serve as a useful supplement to the course." The addition of an index, standard format, and list of additional references would help to improve on the existing handouts (5).

4. During the course of development of this outline for a manual, it became apparent that some areas are too dynamic to keep up to date in the printed format. Consequently, the Air Force Institute of Technology and the Air Force Engineering and Services Center might consider increasing the number of seminars available for Commanders in topics of this nature.

The area of environmental management is an example of an ever-changing field. Supplementing customary instruction for Commanders with a two day seminar, taught at a central location, might help keep Commanders informed of the implications of changes occurring in this area.

5. The context of this outline and any manual developed from it could expand to include the needs of Installation Commanders in the area of facilities management. At some installations, the Base Civil Engineer does not report to the Base Commander, but directly to the Installation commander. In this case, the Installation Commander must remain informed about the many areas of facilities management. Not all Installation Commanders have served as Base Commanders, and therefore may not be familiar with the issues involved in facilities management. The reference manual may help them better understand the operation of base facilities and civil engineering.

6. The outline for the manual is designed to aid the flow of knowledge, which best occurs with the flow of information. During the course of this research, it became apparent that good work communications enhanced the working relationship between the Base Commander and Base Civil Engineer. A product of this good work relationship was the enhanced performance of each, the Commander and the Engineer, in facilities management.

The manual is an effort to enhance communication between the BCC and BCE. A more direct communication tool is the inter-office mail system available through computer systems. The use of the WIMS mail feature, for bases with a terminal in the Base Commander's office, or the mail system on other executive computer systems might enhance communication between Base Civil Engineers and Base Commanders.

Future Research

Future research could adapt this manual outline to other formats or develop further some of the topics included in the manual. Another direction might be to develop other manuals, in related fields or areas that depend on the learning of large amounts of materials over a broad range of subjects. The first recommendation calls for additional manuals to encourage exposure to related areas.

1. The researcher recommends that a manual or guide be developed to cover the Services programs in the Air Force.

The Commanders are exposed to Service's programs for one to one and a half days at the Commander's courses. This educational process might be enhanced with a reference manual, like the facilities manual.

2. Research could investigate the adaptation of the facilities management manual to a format appropriate for the management computer systems that base-level commanders are obtaining for their offices. The goal would be to make the manual available on the desks of the Installation Commander, Base Commander, Deputy Base Commander, and Base Civil Engineer. The WIMS format is suitable for Civil Engineering, and the few Commanders who have this system on their desks, and make use of it. However, senior Commanders are deploying and using a computer system that is more in line with the management aspects of their jobs (i.e., mail system, spreadsheets, and word processing). The manual would be more accessible if it were adapted to the Commander's computer system, on the Commander's desk.

3. Research could expand the depth and range of topics covered in the facilities management manual. The area of readiness, which is the key of Air Force Civil Engineering, was not identified by Commanders and most civil engineers as important to the area of facilities management. This may be a result of perspective provided by the interview discussion, or it may be an underplaying of the role of readiness in the

survival of base facilities in times of hostilities. The manual may help in informing Base Commanders about Civil Engineering's readiness role.

4. While investigating and researching the topics included in the facilities manual, the researcher became aware of the need for additional research in the area of base infrastructures. Infrastructure is important to the long-term condition of the base and its mission. Many Base Civil Engineers expressed frustration at trying to raise the consciousness of the Base Facilities Board to the importance of maintenance of the base infrastructure. Air Force Logistics Command and Tactical Air Command are mounting aggressive campaigns to raise the consciousness of commanders to the condition of base infrastructures. Before improvements can be made, an inventory of Air Force infrastructures is necessary. Before an inventory can be made, some indicators must be developed to understand the current condition of Air Force facility infrastructures. The development of infrastructure indicators is a vital tool in the battle to ensure safe, sound infrastructures are maintained.

Appendix A: Base Civil Engineer's Request for Interview

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

REPLY TO ATTN OF: LSG (Capt Seitz)

SUBJECT: Telephone Interview

TO:

1. As an experienced Base Civil Engineer, you have information vital to the development of a reference manual that will help present and future Base Commanders in the area of facilities management.

2. Capt Jeff Seitz of the current graduate engineering management class is conducting research to prepare such a reference manual. The manual will contain information Base Commanders need to know about facilities management at the base level. Your cooperation in answering four questions during a telephone interview will greatly assist this research.

3. Enclosed is a definition of facilities management, as used for this research project, as well as a list of the interview topics. Capt Seitz will contact your office to establish an appointment for a telephone interview during the week of 28 March, 1988.

4. I hope you will be able to take *10 minutes from your busy schedule to share your* experience with Capt Seitz. By reviewing the topics in advance, you will know the kinds of information he needs. Of course, your participation is voluntary, but we would certainly appreciate your help. Any questions should be directed to Capt Jeffrey Seitz, AFIT/LSG, AUTOVON 785-5435.

JACOB D. DUSTIN, Lt Col, USAF
Associate Dean
School of Civil Engineering
and Services

2 Atch
1. Definition
2. Interview topics

Facilities Management:

Consists mainly of three elements:

1. Provide facilities-buildings, roads, runway, utilities, and real estate.
2. Rehabilitate and Renovate facilities-improving or changing the usefulness of facilities (falls outside maintenance).
3. Maintain facilities-scheduled and non-routine maintenance (outside of user up-keep).

Also includes specialized tasks such as fire protection.

Interview Topics

Base Civil Engineers:

1. Contact between the Base Commander's office and the Civil Engineering unit. Frequency per week of contacts concerning facilities management.

2. Categories of information in facilities management that the Base Commander inquires about? i.e. financing or job/work order status.

3. Base Commander's verses Base Civil Engineer's concept of project or work priorities.

4. Base Commander perspectives you have been exposed to since becoming a Base Civil Engineer.

Appendix B: Base Commander's Request for Interview

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

REPLY TO ATTN OF: LSG (Capt Seitz)

SUBJECT: Telephone Interview

TO:

1. As an experienced Base Commander, you have information vital to the development of a reference manual that will help present and future Base Commanders in the area of facilities management.

2. Capt Jeff Seitz of the current graduate engineering management class is conducting research to prepare such a reference manual. The manual will contain information Base Commanders need to know about facilities management at the base level. Your cooperation in answering four questions during a telephone interview will greatly assist this research.

3. Enclosed is a definition of facilities management, as used for this research project, as well as a list of the interview topics. Capt Seitz will contact your office to establish an appointment for a telephone interview during the week of 28 March, 1988.

4. I hope that you will be able to take 10 minutes from your busy schedule to share your experience with Capt Seitz. By reviewing the topics in advance, you will know the kinds of information he needs. Of course, your participation is voluntary, but we would certainly appreciate your help. Any questions should be directed to Capt Jeffrey Seitz, AFIT/LSG, AUTOVON 785-5435.

JACOB D. DUSTIN, Lt Col, USAF
Associate Dean
School of Civil Engineering
and Services

2 Atch
1. Definition
2. Interview topics

STRENGTH THROUGH KNOWLEDGE

Facilities Management:

Consists mainly of three elements:

1. Provide facilities-buildings, roads, runway, utilities, and real estate.
2. Rehabilitate and Renovate facilities-improving or changing the usefulness of facilities (falls outside maintenance).
3. Maintain facilities-scheduled and non-routine maintenance (outside of user up-keep).

Also includes specialized tasks such as fire protection.

Interview Topics

Base Commanders:

Questions will cover the following topics:

1. Your sources of information about facilities management questions.

2. Categories of information in the areas of facilities management you have discovered you need. Areas of facilities management in which you seek additional information.

3. Future facilities management problems you may be required to face at your base. The kinds of information you may need to address them.

   Does your base have the Civil Engineering WIMS (computer) system installed?

4. Your most important responsibilities in facilities management.

Appendix C: Base Civil Engineer's and Base Commander's Interview Questions

Interview Questions

Base Commanders:

1. I understand that as a facilities manager, a BCC's responsibilities include solving problems concerning facilities. When you, as a manager have a question about facilities problems, where do you go to get the information you need to solve it? So when I ask "what are your best sources of information?", you would say.....?

2. What categories of information have you discovered you need? For example, do you feel many of your questions are in the category of finance issues, or perhaps project status?

Then would you say that finance or status questions do require your investigation?

3. Sir, I really appreciate the information you've provided me on issues and problems you've faced so far. If I could ask you to project yourself to upcoming issues at your base, to future problems you may be required to face. As you look towards the future, do you feel there are any kinds of information you may need?

Do you see yourself using the Civil engineering WIMS system as a future source of information? I've heard that some BCCs even have their own WIMS terminal in their offices.

4. Thinking about your responsibilities in facilities management; please tell me what are your most important responsibilities in facilities management?

Interview Questions

Base Civil Engineers:

1. Thinking of all the methods of contact available between the Base Commander's office and the Civil Engineering unit (phone, in person, etc), approximately how many times per week does the Base Commander's office contact Civil Engineering with questions concerning facilities management?

2. I realize the Base Commander has several sources of information available to him/her. I also know the Base commander frequently makes inquiries to the Civil engineering unit for facilities management information. In your experience, what categories of information in facilities management does a Base Commander most often need?
For instance, are there questions about financing, or job/work order status?

3. I've heard engineers talking and agreeing that our job is to support the needs of the Base Commander. They've also agreed that this involves providing the engineer's professional judgement in situations that are in question. I understand there are times that the Base commander may not see things in the same light as the engineer. From your experience, are there areas that Base Commanders tend to underprioritize? What are they?

If a Base Civil Engineer feels he needs to urge a higher (or lower) priority, are there any strategies that have been helpful in readdressing the Commander's perspective? If so, what are they?

4. This information will be very useful to me. In order for me to comprehend the extend of Base Commander perspectives I could be gathering from, please tell me how many Base Commanders you've worked for since becoming a Base Civil Engineer?

Interview Questions

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VITA

Captain Jeffrey P. Seitz [redacted] in 1974 [redacted] attended the University of Wisconsin-Platteville, from which he received a Bachelor of Science in Civil Engineering in December 1976. Upon graduation, he attended Officer Training School, receiving his commission in May 1979. He attended Pilot Training at Vance AFB and received his wings in April 1980. Next, he attended 135 Conversion Training at Castle AFB CA in preparation for his assignment to the 70th Air Refueling Squadron of the 305 ARW at Grissom AFB IN. At Grissom AFB, Capt Seitz flew KC-135 and EC-135 aircraft.

Capt Seitz was selected to fly the North Atlantic Treaty Organization's (NATO) new E-3A aircraft at NATO AB Geilenkirchen, Federal Republic of Germany (West Germany). During this tour from April 1983 until May 1987, Capt Seitz served as E-3A Co-pilot, First Pilot, Aircraft Commander, and Instructor Pilot on NATO's international crews.

In May 1987 Capt Seitz arrived at the Air Force Institute of Technology to study Engineering Management. He will serve in the 1003 Civil Engineering Squadron at Peterson AFB CO.

Capt Seitz has completed Squadron Officer School by correspondence and in residence, as well as completing Air Command and Staff College in seminar.

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ABSTRACT

The purpose of this study was twofold. The primary intent was to identify appropriate content for a reference manual that would summarize for Base Commanders and Deputy Base Commanders, procedures and constraints involved in the management of Air Force facilities. The secondary intent was to produce an outline for this manual.

The research was directed by six investigative questions that include the following: 1) What are the responsibilities of the Commander's job in facilities management? 2) What information sources are available to prepare the new Commander for these responsibilities? 3) What information do these sources give the Commander? 4) What additional information, not supplied by existing sources, do experienced Commanders say they need to know about facilities management and civil engineering operations? 5) Where can this additional information be found? 6) How can this information be compiled into a book format useful to Commanders? The research answers each of these questions.

Information and topics were gathered through 50 structured telephone interviews of 25 Base Commanders and 25 Base Civil Engineers. In addition, information was gathered from research of literature, review of the curricula of two Commander's facilities management courses, and interviews of topic specialists. Research also included the aspects of manual design characteristics.

The research identified 16 topics that a reference manual on facilities management should include to fulfill the needs of Base Commanders. Topics identified for inclusion are: Base Civil Engineering Organization, In-Service Work, Civil Engineering and Contracting, Requirements Identification and Programming, Approval Authority, Financial Management, Military Construction Program, Comprehensive Planning, Military Family Housing, Environmental Planning Overview, Asbestos Management, Facility Energy Management, Infrastructure, Funding of MWR Facilities, Mission Changes, and Statutory Limitations.