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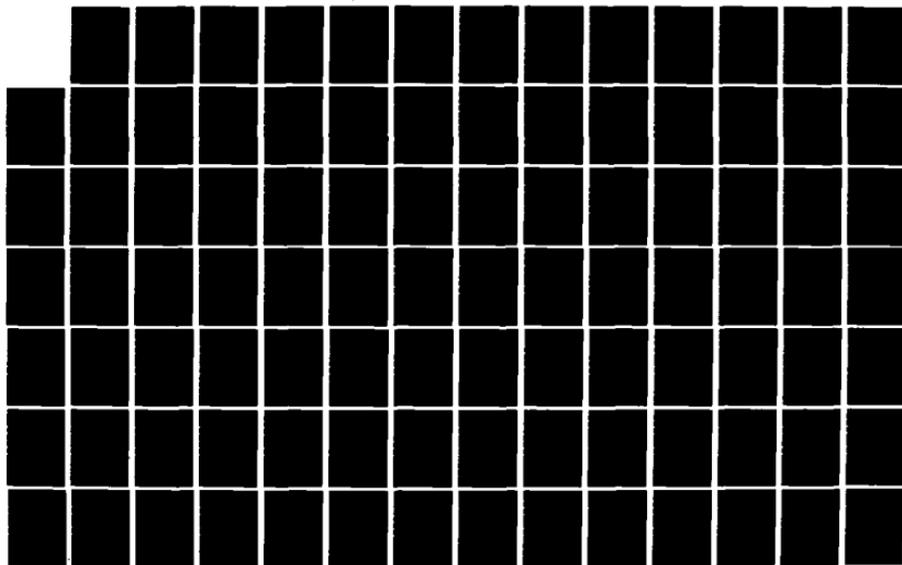
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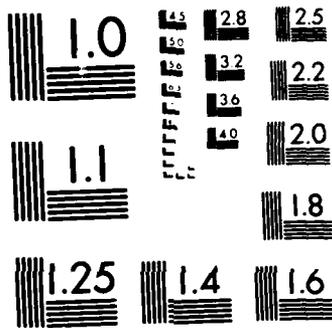
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EFFECT OF READY RESERVE FORCES ON
THE CONUS SUSTAINING FORCE CONCEPT

York D. Thorpe, Captain, USAF

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This research determined the effect of the manpower shortage created by Ready Reserve personnel who hold emergency essential (wartime) civilian civil engineering positions on anticipated CONUS Sustaining Force manning. Seventy CONUS bases were used in the study. Six MAJCOMs (AFLC, AFSC, ATC, MAC, SAC, AND TAC) and the USAFA provided data on the number of Ready Reserve personnel who hold emergency essential positions for their respective bases. Descriptive analysis of these data combined with data from the CONUS Sustaining Force Manpower Standard Study determined the manpower shortage for the six MAJCOMs and the USAFA. Initial results indicated that four MAJCOMs (AFLC, ATC, MAC and SAC) and the USAFA exceeded the established manpower shortage criteria. However, AFR 40-910 specifies that only Standby Reservists and military retirees can hold emergency essential positions. Therefore, only two MAJCOMs (ATC and SAC) will still have a manpower shortage. A review of pertinent Air Force regulations, together with interviews with three Civil Engineering experts, provided three recommended methods for filling vacated emergency essential civilian positions: acquiring overhires, re-training, and using civilian contractors.

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EFFECT OF READY RESERVE FORCES ON THE CONUS
SUSTAINING FORCE CONCEPT

A 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

By

York D. Thorpe, BS
Captain, USAF

September 1983

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This thesis, written by

Captain York D. Thorpe

has been accepted by the undersigned on the behalf of the
faculty of the School of Systems and Logistics in partial
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CHAPTER I

INTRODUCTION

Overview

The Air Force has placed much emphasis on overall force readiness. Within Civil Engineering, Prime BEEF (Base Engineering Emergency Force) is the major way of accomplishing this objective. Prime BEEF is the wartime mission of Civil Engineering, whose forces must be ready to deploy anywhere in the world during a major conventional war. Still another important goal in achieving force readiness is to provide assured civil engineering support for Continental United States (CONUS) bases during a major conventional war overseas (Carr, 1980a).

Based on current analysis, there are not enough military civil engineering personnel to meet all identified wartime theater requirements (Carr, 1980b). To provide and meet the most essential civil engineering requirements requires maximum use of the civilian civil engineering work force. One key method of achieving such maximum use is the CONUS Sustaining Force Concept. This concept quantifies the civil engineering manpower requirements (military and civilians) for all CONUS bases that are necessary to provide minimum

essential Operations and Maintenance (O & M) activities required to accomplish CONUS base missions (Coullahan, Jackson, Lee, Robinson, and Ryan, 1982, p. 1-1).

Background

The CONUS Sustaining Force Concept officially began in January 1980 as a milestone of the Prime BEEF reposture effort. Designed to make maximum use of the civilian work force in indirect combat roles, it frees the military for direct combat support (Smith, 1980). According to Major Carr (1980a), the concept was developed around the following scenario:

Persistent Soviet military momentum and a sensitive Middle East situation provide opportunities for application of Soviet military capability short of a nuclear exchange. Readiness is no longer just a matter of strategic bombers or missiles on alert; it is now a matter of fighters and airborne radar, airlift and global communications, refueling and ready spare parts, maintenance and sortie rates as well. Successful conduct of conventional warfare is highly dependent on introducing augmentation forces into required support areas. Civil Engineering and Services mobile forces are expected to be ready to respond in 28 hours for movement to preselected locations to provide complete base support for up to 180 days--no CONUS combat activity is likely to occur. Civilian personnel will be used to the maximum extent in meeting CONUS requirements to free additional military personnel for overseas deployment.

The Air Force civil engineering function, as opposed to the Army or Navy, has the largest combat support CONUS requirements (Lupia, 1982). The CONUS missions requiring support during a conventional war include:

- (1) Strategic Air Command -- Strategic offensive weapons systems including missiles, bombers, and

tankers which disperse and then recover in the CONUS.

- (2) Military Airlift Command -- Strategic aerial ports.
- (3) Tactical Air Command -- Strategic air defense including tactical fighter operations, interceptors, and radar surveillance.
- (4) Air Force Logistics Command -- All the logistics depot functions that make up our logistics support bases.
- (5) Air Training Command -- All training requirements.
- (6) Air Force Systems Command -- Research and development efforts; industrial production (Lupia, 1982).

The primary purpose of the CONUS Sustaining Force Concept was to identify shortfall areas and resources that may be required during a conventional war. In other words, does civil engineering have the capability to meet the requirements of the missions outlined above?

Justification for Study

The CONUS Sustaining Force Concept was developed to quantify the workload which is to be satisfied primarily through the use of civilians in the Base Civil Engineering work force. The Air Force Engineering and Services Center (AFESC) conducted a manpower study that quantified the minimal number of civilians required to provide assured civil engineering support for CONUS bases during a conventional

war. However, the AFESC study failed to consider what manpower shortage mobilizing the Ready Reserve forces may create. Therefore, the CONUS Sustaining Force manpower study required further evaluation.

Problem Statement

Much work has been done in identifying the emergency essential civilian manning requirements to keep the CONUS bases operational during a major conventional war overseas. If many of the emergency essential positions are held by civilians who are in the Ready Reserves, it may have a significant effect on the manning for the CONUS Sustaining Force. The manpower shortage created in the CONUS Sustaining Force by mobilizing the Ready Reserve was the focus of this research effort.

Research Objectives/Research Questions

This research effort focused on the following objectives:

Research Objective 1.0 -- Describe the manpower shortage that the Ready Reserve personnel will cause for the CONUS Sustaining Force manning. To accomplish this objective, the research effort addresses the following questions:

Research Question 1.1 -- How many Ready Reserve personnel hold emergency essential (wartime) civilian positions in civil engineering?

Research Question 1.2 -- How do the Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering affect existing CONUS Sustaining Force manning requirements?

Research Objective 2.0 -- Determine ways to compensate for manning shortfall due to Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering, if the manning shortfall has a significant effect on existing CONUS Sustaining Force manning requirements. To accomplish this objective, the research effort addresses the following questions:

Research Question 2.1 -- How do the civilian regulations address the problem of Ready Reserve personnel holding emergency essential (wartime) positions?

Research Question 2.2 -- What are ways of filling vacancies created by Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering?

2.2a -- Can vacancies be filled with civil engineering personnel from the Individual Mobilization Augmentee Program (IMA)?

2.2b -- Are overhires appropriate?

2.2c -- Will retraining (one AFSC to another)
be appropriate?

2.2d -- Can civilian contractors be used?

Scope and Limitations

This research was limited to civilians in CONUS base civil engineering organizations who occupy emergency essential positions (not key emergency essential positions), and who are also members of the Ready Reserve force. Furthermore, the research considered the impact of these members only on existing CONUS Sustaining Force manning requirements.

The research effort covered the time period since the CONUS Sustaining Force Concept was established in January 1980. Also, most literature used in this research was obtained from the Air Force Engineering and Services Center (AFESC) and Air Force Regulations and Publications. Literature obtained from AFESC was in the form of letters, briefing papers, and a CONUS Sustaining Force Manpower Standard Study.

Definitions

This section defines some of the terms that were used throughout this research.

The terms and definitions are as follows:

1. Emergency -- A major conventional war overseas in which the United States is directly involved.

2. Emergency Essential Position -- A civilian position whose performance is critically essential to the support of assigned Air Force missions at the beginning and in the early stages of an emergency (AFR 40-910, 1982, p. 4).
3. Key -- Emergency Essential civilian positions that are most critically needed in an emergency (AFR 40-910, 1982, p. 4).
4. Major Conventional War Overseas -- Any war overseas that directly involves the deployment of the CONUS base civil engineering Prime BEEF teams.
5. Ready Reserve -- All members of the Reserve Forces who have agreed or are obligated to report for active military duty at the call of the President or the Congress, or when otherwise authorized by law. A member of the Ready Reserve is in one of the following categories (AFR 40-910, 1982, p. 4):
 - (1) A member of the Selected Reserve:
 - (a) Air Force Reserve Units (Air National Guard and Air Force Reserve).
 - (b) Troop Program Units (Army National Guard and Army Reserve).
 - (c) Selected Reserve Units (Navy Reserve and Coast Guard).
 - (d) Selected Marine Corps Reserve Units (Marine Corps Reserve).

(e) Individual Mobilization Augmentee (IMA)--
All services except the Navy. The IMAs are trained Reserve personnel who will be assigned to the active duty forces in the time of war or as the national security requires. The IMA's principal purpose when mobilized to their assigned active duty unit is to augment the active force during a major conventional war overseas or during a national emergency (AFR 35-34, 1982, p. 1).

(2) A member of the Individual Ready Reserve (IRR).

(3) A member of the Inactive National Guard (Army National Guard only).

6. Screening -- A supervisor takes actions to identify employees who are members of the Ready Reserve serving in key positions and request their removal from the Ready Reserve (AFR 40-910, 1982, p. 4).

Literature Review

As stated earlier, the CONUS Sustaining Force Concept project began in January 1980 as a milestone of the Prime BEEF reposture effort. The CONUS Sustaining Force Concept was developed to quantify the workload during a major conventional war which is to be satisfied primarily through the use of civilians in the Base Civil Engineering work force (McMahon, 1980).

In developing the CONUS Sustaining Force Concept, Headquarters United States Air Force Engineering and Services (Hq USAF LEE) tasked each CONUS Major Command (AFSC, AFLC, ATC, MAC, SAC, TAC, and USAFA) for initial identification of in-place base civil engineering work force (both military and civilians) requirements for stateside operations support during a major conventional war (Carr, 1980a). To assist in developing the in-place work force requirements, a wartime organizational tasking by major work centers that can be applied to all bases organized according to AFR 85-10 (Atch 1) was derived. According to Major Carr (1980a), the outline of Base Civil Engineering Organizational Structure and Functions during War-time Operations was as follows:

1. Office of Base Civil Engineer -- Civilian deputy assumes the position of Base Civil Engineer if the Base Civil Engineer deploys. Deputy will limit activities to overall management, coordination, and direction.
2. Financial Management -- Maintain this function at a reduced scale. Confine financial support to priority I and Priority II work, and emergency contract work.
3. Industrial Engineering -- Terminate performance of consultant and analysis tasks, quality assurance functions, and special studies. Maintain real property function at all bases in a caretaker

status. Perform minimum cost accounting tasks for emergency work.

4. Squadron Section and Administration -- As the Prime BEEF forces deploy, eliminate squadron sections. Form an administrative pool to handle correspondence and reports from all divisions within the Base Civil Engineering organization.
5. Fire Protection -- The following assumptions and configuration are provided for a typical fire station during wartime operations:
 - (a) Fire protection personnel will support mission of deploying aircraft.
 - (b) Fire protection operations personnel will accomplish essential technical services functions.
 - (c) Alarm room operators will assume Base Civil Engineering after duty service call functions.
 - (d) Typical manning for a base will consist of 18 professional fire fighters (16 crew members and 2 supervisors) plus 14 auxiliary fire fighters (11 crew members and 3 alarm room operators) for a total of 32 personnel.
5. Engineering and Environmental Planning -- The Engineering and Environmental Planning functions are generally nonessential for wartime operations. However, all assigned civilians possessing AFSC 5525X

are identified as minimum essential personnel. Their responsibilities will consist of contract construction inspections, programming of emergency contracts, technical representation to O and M shop supervisors, and engineering and design.

7. Operations -- Reconfigure the Operations branch considerably. Within the Operations branch only priority I and priority II, and emergency work will be performed. Planning activities will be accomplished by the shop supervisor. Next, the service call and customer service functions will be combined. The material control function will remain intact. The various shops' daily work schedule will be reduced to a minimum. Accomplishing recurring maintenance for operational support requirements (runway lights, power generations, and aircraft arresting barriers) will continue. All necessary service contracts will remain in force. Also, special emphasis is required to ensure all utilities (water, sewage, electrical, and gas) are operational.
8. Family Housing Management -- There should be little change in requirements during wartime operations.

Additional guidelines were established by Hq USAF LEE. First, each MAJCOM had to consider the wartime mission (base use plan) of their bases. Next, in accomplishing the identification of wartime civilian manning requirements (along with military) care was taken to dispel rumors of adverse

action or loss of employment. Neither identification for nor omission from the emergency essential force posture for wartime was construed as affecting peacetime employment (Carr, 1980a). Finally, each MAJCOM was required to consider military strategic withhold forces. In considering wartime work requirements, strategic withhold forces were limited strictly to direct combat support of strategic offensive, defensive, and airlift operations. Functions not directly supporting launch and recovery of aircraft, and launch of missiles are considered as indirect combat support.

As guidance for the identification of civilian requirements was released to the major commands, an information copy was provided to two major labor unions, the National Federation of Federal Employees (NFFE) and the American Federation of Government Employees (AFGE). This information copy of the letter served as a basis to keep the unions informed of new developments by the Air Force which involved the civilian work force (Carter, 1980). According to Major Carr (1980a) the AFESC developed other specific guidance that would minimize the CONUS base manpower requirements. First, minimum maintenance and operation tasks are performed. Next, routine or low priority (priority II and priority IV) base civil engineering work is deferred or not done at all. Also, maintenance cycles for non-critical equipment are extended. Finally, the regular 40-hour workweek during peacetime is increased to 60 hours during wartime. The increase in weekly

workhours somewhat compensates for effort lost through deploying military technicians, thus reducing the CONUS bases manpower requirements.

In June 1980, Major Carr indicated that the initial command replies pertaining to the civilian manpower requirements were satisfactory, but shortages were identified in several AFSCs. Replies received from AFLC, AFSC, MAC, and USAFA indicated overages. TAC had to reaccomplish its initial plan based upon some misunderstanding of reporting criteria, and SAC did not submit an input until GLOBAL SHIELD 80 was completed. Meanwhile, ATC indicated shortfalls of personnel in practically all areas. This was largely caused by a difference in opinion concerning planning criteria (Carr, 1980b). Throughout the various commands, shortages were identified in liquid fuels, power production, exterior electric, fire fighters, and a few other AFSCs (Coullahan, 1981).

SMSGT Smith (1980) indicated there was not enough civilian manpower in civil engineering to cover all identified emergency essential work centers. These Base Civil Engineering Work Centers are identified by their Functional Account Code (FAC). Various AFSCs are associated with each FAC or Work Center. The following were emergency essential civil engineering functions that require manning in order to sustain minimum operation of the CONUS bases (Coullahan and others, 1982, pp. 1-1 - 1-2):

FACWORK CENTER TITLE

4400	Civil Engineer
4401	C.E. Unit Administration
4402	C.E. Administration Management
4403	Industrial Engineering
4404	Real Estate/Cost Accounting
4406	Family Housing Management
4411	Financial Management
4420	Engineering and Environmental Planning
4421	Engineering - Technical and Design
4422	Contract Management
4423	Environmental and Contract Planning
4425	Fire Protection
4426	Fire Protection
4427	Fire Protection
4430	Operations
4432	Family Housing Maintenance - Supervision
4433	Medical Facility Maintenance - Supervision
4435	Resources and Requirements
4436	Production Control
4437	Planning
4438	Readiness and Logistics
4440	Pavements and Grounds
4441	C.E. Equipment Operations
4442	Pavements
4443	Grounds Maintenance

<u>FAC</u>	<u>WORK CENTER TITLE</u>
4450	Structures - Superintendent
4451	Structure Maintenance
4452	Protective Coating (Painting)
4453	Plumbing
4454	Metal Working
4455	Masonry
4460	Mechanical - Superintendent
4461	Refrigeration and Air Conditioning
4462	Liquid Fuels System
4463	Heating System
4466	System Management
4467	Energy Monitoring Control Systems (EMCS) Operations
4468	Instrument Control
4469	Electronic Control
4470	Electrical - Superintendent
4471	Interior Electrical
4472	Exterior Electrical
4480	Electrical Power Production
4490	Sanitation
4491	Water and Waste
4492	Custodial Service
4493	Engineering Entomology
4494	Refuse Collection and Disposal

Appendix A describes the function of each Work Center.

The MAJCOMs' revisions of their initial inputs were sent to Hq AFESC/DEOP for review. Hq AFESC/DEOP reviewed the data for compliance with the functional guidance set forth by Hq USAF LEE. In June 1980, the MAJCOM inputs were forwarded to the Air Force Engineering and Services Management Engineering Team (AFESC/MET) for their utilization in the development of Air Force manpower standards for the Civil Engineering CONUS Sustaining Force (Coullahan and others, 1982, p. 3-1). Originally, the AFESC/MET was tasked to develop wartime CONUS Sustaining manning equations which would apply Air Force wide. Two potential workload factors (WLFs) were identified: square feet of floor space and wartime base population (Coullahan and others, 1982, pp 2-2 - 2-3). Several problems existed which made it difficult to develop a manning equation which was applicable to all MAJCOMs. First, statistical analyses revealed that Air Force wide equations could not be attained at either the total or functional grouping level. Next, the input data were separated by categories according to the base mission. For example, a base with an essential flying mission during a contingency will have a continuous operation, while a non-essential base would be closed except for minimum base facility maintenance and security. Preliminary analysis indicated that no relationship of the workload factors among the bases satisfied AFR 25-5 statistical criteria (Coullahan and others, 1982, p. 3-1). These criteria were:

- (1) Type I $R^2 > .75$ and $V < .15$
- (2) Type II $R^2 > .50$ and $V < .25$
- (3) F - test with a 95% confidence interval.

where:

- (a) R^2 is the Coefficient of Determination -- This is the proportion of the total variation that is explained by the regression line.
- (b) V is the Coefficient of Variation -- This is used to establish criteria for the levels of acceptable variability in a regression equation.
- (c) The F - test is used to determine if an equation explains or accounts for more of the variability in the manpower than is left unexplained (AFR 25-5, 1982, pp. 33-5, 40-2 - 40-4, A2-1).

Finally, certain functions were not applicable within each command or the workload could not be logically associated with either workload factors (square feet of floor space or wartime base population) (Coulahan and others, 1982, p. 2-1). These functions not standard within each command were Railroad Maintenance (FAC 4444), Range Maintenance (FAC 4445), and Natural Resources (FAC 4446), so these three functions were excluded from the manpower standard. Also, the fire department activities (FAC 4425, 4426, and 4427) were excluded from the manpower standard. Analysis revealed that neither wartime base population nor square feet of floor space was acceptable for determining manning for this function. The method for determining fire operations requirements is contained in the FY 83 Force Sizing (FORSIZE) Guidance.

Since AFESC/MET could not develop a usable equation, another approach was taken. AFESC/MET decided to separate

the bases by command and regress total requirements against the workload factor - wartime base population. The workload values were obtained from the CONUS BASE USE PLAN, dated 24 March 1982. The standard manpower equations varied from one command to another. The manpower equations were based on a straight-line equation. Also, certain normal peacetime taskings were eliminated and the manpower equations were developed based upon 243 monthly available manhours (wartime emergency) instead of the normal 145.3 manhours (Coullahan, 1983). Additionally, subequations were developed for the distribution of the total CONUS Sustaining manpower requirements to each functional account code (FAC) for the individual MAJCOM.

After the manpower equations were developed, manning requirements were computed for the various bases in each MAJCOM. However, before any manpower requirements were determined, AFESC/MET transcribed the MAJCOMs input data into functional account code format. All inputs were checked for Air Force FACs and AFSC digits/titles and accuracy. Also, several bases were excluded from the manpower standards. First, installations receiving civil engineering support from the San Antonio Real Property Maintenance Agency (SARPMA) were excluded. These bases were Lackland, Randolph, Kelly and Brooks. SARPMA wartime requirements were determined, but a decision on the distribution of manning was withheld. Next, when statistical analysis was conducted on the manpower equations, several outliers were identified. With these inputs

included, manpower equations for SAC did not meet criteria 2 and 3. Therefore, these inputs were excluded from the final calculations in order to meet AFR 25-5 statistical criteria (Coullahan and others, 1982, p. 2-1). Bases excluded were Vandenberg, Griffiss, and Loring.

The manning requirements computed by the AFESC/MET were compared with the requirements submitted by the MAJCOMs. The results of the manpower standard study indicated the civilian manning for overall Air Force was sufficient to maintain essential CONUS base O and M activities. Also, the manning requirements computed by the AFESC/MET were greater than the manning requirements submitted by each MAJCOM except ATC. Results indicated there was a shortfall of 235 civilians in ATC.

In October 1982, the Manpower Study Final Report on Civil Engineering CONUS Sustaining (Wartime) Standard was submitted to each MAJCOM for review and approval or disapproval (Jackson, 1982). Replies from the MAJCOMs concerning the study were due to the AFESC/MET in December 1982 (Tillman, 1982). Even though the CONUS Sustaining Force Concept has been underway for approximately three years, this manpower study was the first cut at developing a usable Civil Engineering CONUS Sustaining Force Manpower Standard.

SMSGT Tillman indicated that the civilian manning requirements incorporated in the manpower standards study were sufficient to maintain essential CONUS base O and M activities.

Also, he expected the replies from the MAJCOMS to be acceptable (Tillman, 1982).

In January 1983, SMSGT Tillman stated the MAJCOMS did not totally agree with the manning requirements that were computed by the AFESC/MET (Tillman, 1983). After some minor revisions and approval by the MAJCOMS, AFESC/MET will then forward the CONUS Sustaining Manpower Study to all CONUS bases. Each base will use the allotted civilian manning that was incorporated in the study and apply it to the emergency essential (wartime) civil engineering functional work centers. However, SMSGT Tillman indicated that the AFESC and the MAJCOMS did not make any concession for civilians in the Ready Reserve Programs. Also, he stated this oversight may or may not have a significant affect on the CONUS Sustaining manning requirements (Tillman, 1982).

Conclusion

This chapter presented a brief introduction to the Civil Engineering CONUS Sustaining Force Concept. A brief overview of the concept was presented. Next, background information on the development of the concept was presented. Also, the limits of the research effort were discussed. Two research objectives with several research questions were presented, forming the basis for this research. Finally, development of the CONUS Sustaining Force concept was discussed.

The following chapter will discuss in detail the methodology for answering the research questions. Analysis of the

data will be presented in Chapter III. Conclusions and recommendations will be discussed in the final chapter.

CHAPTER II

METHODOLOGY

Overview

This chapter consists of a discussion of how the research effort was carried out. Included are discussions on the breadth of study, the data collection, and the plan for answering the research questions which in turn will accomplish the two research objectives. Also, the assumptions and limitations of the research questions, and the collection and treatment of the data are discussed.

Breadth of Study

Universe

The universe under study consisted of all CONUS Air Force bases. During a major conventional war overseas, the CONUS bases civil engineering work force is reduced mainly to civilian personnel. However, in most cases the civil engineering workload is reduced. Although the workload is reduced, the major objective of the CONUS Sustaining Force Concept is to ensure there are enough civilian civil engineering personnel to perform minimal essential Operations and Maintenance activities during a major conventional war overseas.

AFESC CONUS Sustaining Force Population

There were 80 CONUS Air Force bases, including the Air Force Academy (USAFA), used in the AFESC CONUS Sustaining Force Manpower Study.

Data Producing Population

The population in this research was limited to the civilian civil engineering work force at 70 CONUS Air Force bases (including the USAFA). Appendix B is a list of the CONUS Air Force bases involved in this research effort. The bases were grouped according to the six Major Commands. The Major Commands were:

1. Air Force Logistics Command (AFLC)
2. Air Force Systems Command (AFSC)
3. Air Training Command (ATC)
4. Military Airlift Command (MAC)
5. Tactical Air Command (TAC)
6. Strategic Air Command (SAC).

There were several reasons why only 70 CONUS Air Force bases were used in this research. First, data required for this study was not available at three bases. These bases were Davis-Monthan, Luke, and Shaw. Second, four CONUS Air Force bases (Brooks, Kelly, Lackland, and Randolph) receiving civil engineering support from San Antonio Real Property Maintenance Agency (SARPMA) were excluded from the AFESC CONUS Sustaining Force Manpower Standard Study. Even though the

manning requirements for these bases were determined collectively, the AFESC could not develop an appropriate method for distributing the manning among each base. Finally, three bases did not meet AFR 25-5 statistical criteria as explained earlier. These bases were Griffiss, Loring, and Vandenberg.

Additionally, civilian positions in all civil engineering functions with the exception of the Fire Department, Railroad Maintenance, Range Maintenance, and Natural Resources were included in this research effort. These functions were not included in the AFESC CONUS Sustaining Force Manpower Standard Study.

Data Collection Plan

The data necessary for this research effort were collected from two basic sources. First, results from the existing CONUS Sustaining Force Manpower Standard Study were used as the original data source. Data from the manpower standard study provided the number of civil engineering civilians that are required to perform minimum essential Operations and Maintenance activities for the various CONUS bases. The second source of data collection was by a telephone questionnaire. The telephone questionnaire was directed to the Civil Engineering Readiness Division at each MAJCOM and the USAFA. The telephone questionnaire contained one question to collect quantitative data. The question was used to collect data on the number of civilians who are members of the Ready Reserve

forces and who also hold an emergency essential (wartime) civilian position in the civil engineering organization at the various CONUS bases. The data collected from the telephone questionnaire were used to determine what manpower shortage the Ready Reserve personnel will create in the existing CONUS Sustaining Force manning requirements. The data collection using the telephone questionnaire began on 11 April 1983. The cutoff date for receiving responses (data) from the MAJCOM was 30 July 1983.

Sampling Plan

To determine the effect that the Ready Reserve personnel who hold emergency essential (wartime) positions in the CONUS base civil engineering organizations has on existing CONUS Sustaining Force manning requirements, a census was taken of the bases in each CONUS MAJCOM and the USAFA. The census entailed a telephone questionnaire to each CONUS MAJCOM and the USAFA Civil Engineering Readiness Division. It was easier to obtain the required data from each MAJCOM rather than from each individual base.

Survey Instrument

The survey instrument (telephone questionnaire) contained one question which was designed to identify the number of Ready Reserve personnel who hold emergency essential (wartime) positions in the various bases civil engineering organization for each CONUS MAJCOM. The questionnaire was designed to provide very specific information concerning the Ready personnel.

The telephone questionnaire was designed so that one person in each MAJCOM Civil Engineering Readiness Division could answer the questionnaire simply by providing a copy of the base's input for that particular command. It was believed a greater response rate would be realized if only one person in the Readiness Division had only to make a copy of the bases' inputs, and then forward the information.

The telephone questionnaire consisted of one question. However, this question has seven categories. The telephone questionnaire was based upon the following research question:

How many Ready Reserve personnel hold emergency essential (wartime) civilian positions in civil engineering?

More specifically, the question used in the questionnaire was as follows:

What is the number of civilians who are members of the Ready Reserve forces, and who also occupy an emergency essential (wartime) civilian position in the Base Civil Engineering Organization for the respective bases in your command?

This question was divided into the following categories:

- (1) The number of civilians who are members of a Ready Reserve Unit (Air Force, Army, Coast Guard, Marine Corps, or Navy).

- (2) The number of civilians who are members of a National Guard Unit (Air, or Army).
- (3) The number of civilians who are Individual Mobilization Augmentees (All services except Navy).
- (4) The number of civilians who are members of the Individual Ready Reserve (IRR).
- (5) The number of civilians who are Retired Reserve (nonpaid) and (paid) (not yet age 60).
- (6) The number of civilians who are Standby Reserves.
- (7) The number of civilians who are Retired Military (not yet age 60 and not for disability reasons).

This telephone questionnaire was administered to each MAJCOM and the USAFA.

Data Classification

The data from the existing CONUS Sustaining Force Manpower Standard Study were descriptive in content. These data described the civil engineering manning requirements for each CONUS base in the six MAJCOMS and the USAFA. Additionally, the data collected by the telephone questionnaire were descriptive in content. These data provided the number of civilians who are members of the Ready Reserve forces and who also hold an emergency essential (wartime) civilian position in each CONUS base civil engineering organization.

Data Analysis

This section describes the analysis of the data collected. The analysis procedures provided the results necessary to answer the research questions that were stated in Chapter I, thus accomplishing the two research objectives. The analysis procedures used in this research effort did not lend themselves to any statistical testing. Therefore, no statistical analysis was used. The appropriate analysis procedure is explained for each research objective/research question.

Research Objective 1

The purpose of research objective one was to determine the manpower shortage that is created by civilians who are members of the Ready Reserve forces and who also hold an emergency essential (wartime) civilian position in the various CONUS bases civil engineering organization. The research objective was "Describe the manpower shortage that the Ready Reserve personnel will cause for the CONUS Sustaining Force manning." Two research questions were used to accomplish this objective. The first research question was "How many Ready Reserve personnel hold emergency essential (wartime) civilian positions in civil engineering?" The second research question was "How do the Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering affect existing CONUS Sustaining Force manning requirements?" The data collected from the

telephone questionnaire were used to answer research question one. Also, these same data were used with data from the existing CONUS Sustaining Force Manpower Standard Study to answer research question two.

Initially, several statistical approaches were reviewed for the purpose of analyzing the data. None of the approaches were appropriate. In an interview with Captian Woodruff on 6 April 1983, he suggested the best approach for analyzing the data was by using simple descriptive analysis (Woodruff, 1983). In using simple descriptive analysis, the data from the telephone survey were subtracted from the existing CONUS Sustaining Force Manpower Standard Study data to determine the manpower shortage created by Ready Reserve personnel who hold emergency essential (wartime) civilian positions in civil engineering for each CONUS base.

To effectively accomplish research objective one, a criterion was established. The criterion was "If the computed results from the telephone questionnaire data and the CONUS Sustaining Force Manpower Standard Study data were greater than the following ranges, there exists a manpower shortage:

- (1) 0% - 5% -- This range was established for CONUS civil engineering squadrons whose workload will increase due to the mission of the base during a major conventional war overseas. If the manpower shortage was greater than

5%, the capability to effectively perform all minimum essential O and M activities will not exist. Bases in ATC and SAC were considered in this range.

(2) 0% - 10% -- This range was established for CONUS civil engineering squadrons whose workload will remain the same due to the mission of the base during a major conventional war overseas. If the manpower shortage was greater than 10%, the capability to effectively perform minimum essential O and M activities will not exist. Bases in AFLC, AFSC, MAC, and USAFA were considered in this range.

(3) 0% - 20% -- This range was established for CONUS civil engineering squadrons whose workload will decrease due to the mission of the base during a major conventional war overseas. If the manpower shortage was greater than 20%, the capability to effectively perform minimum essential O and M activities will not exist. Bases in TAC were considered in this range.

These ranges were established after conducting telephone interviews with either the Deputy Base Civil Engineer, Deputy Chief of Operations, or Chief of Industrial Engineering of a randomly selected base from each MAJCOM (Corbett, 1983; Dawson, 1983; Haggstrom, 1983; Horstman, 1983; Kennedy, 1983; Villarreal, 1983; Winters, 1983).

Research Objective 2

The second research objective was "Determine ways to compensate for manning shortfall due to Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering, if the manning shortfall has a significant impact on existing CONUS Sustaining Force manning requirements." The purpose of this objective was to recommend possible sources of filling the emergency essential (wartime) civilian positions in civil engineering that are vacated by Ready Reserve personnel during a major conventional war overseas. Different analysis techniques were used to analyze the research questions associated with research objective two.

The first research question was "How do the civilian regulations address the problem of Ready Reserve personnel holding emergency essential (wartime) civilian positions?" In answering this question, AFR 40-910 (Emergency Essential (E-E) Program) was reviewed and analyzed. Interpretations of the regulation's rules and requirements were made as they pertain to the emergency essential positions in civil engineering.

The second research question provided ways of filling the manning shortage created by the Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering. This research question was "What are ways of filling vacancies created by Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering?" There were four component questions for the second research question. Each question was analyzed separately. The first question was "Can vacancies be filled with civil engineering personnel from the Individual Mobilization Augmentee Program (IMA)?" To answer this question, two approaches were used. The first approach was to review AFR 35-34 (Individual Mobilization Augmentee Program) and the USAF Engineering and Services IMA Management Plan. The review determined the role of the Individual Mobilization Augmentee during a national emergency (major conventional war overseas). Second, AFR 40-910 was reviewed to see what criteria were established for IMAs who hold emergency essential positions. The ultimate objective was to determine if the Individual Mobilization Augmentees can fill vacancies created by Ready Reserve personnel.

The second component question was "Are overhires appropriate?" To answer this question, the Manpower regulations (26 series) were reviewed and a telephone interview conducted. The regulations and telephone interview were used to determine what criteria were necessary for obtaining civilian overhires during a national emergency (major conventional war overseas).

The third component question was "Will retraining (Changing from one AFSC to another) be appropriate?" To effectively answer this question, AFR 400-430 (Retraining) was reviewed. Also, a personal interview was conducted. The regulation and personal interview were used to determine the criteria for retraining a civilian during a major conventional war overseas. Ultimately, the objective was to determine if retraining was a viable alternative for filling emergency essential (wartime) civilian positions in civil engineering that are vacated by Ready Reserve personnel.

The final component question was "Can civilian contractors be used to fill vacancies created by Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering?" AFR 70-7 (Contingency Contracting Support Program) and a personal interview were used to provide the answer to this question. The objective was to determine if there were any specific provisions set aside to employ civilian contractors during a national emergency (major conventional war overseas).

To aid in accomplishing research objective two, several criteria were established:

- (1) Results from research objective number one must show that there was a significant impact of manpower shortage on the existing CONUS Sustaining Force Manpower Standard Study. This manpower shortage is caused by Ready Reserve personnel

vacating emergency essential (wartime) civilian positions in civil engineering.

- (2) Rules and procedures stipulated in the Civilian Personnel, Manpower, Individual Mobilization Augmentee Program, and Contracting regulations cannot be violated when analyzing the various ways to fill manning shortages created by the Ready Reserve personnel.

Results from research objective number two determined if the methods proposed to fill the emergency essential (wartime) civilian positions in civilian engineering that are vacated by Ready Reserve personnel were appropriate.

Summary of Assumptions and Limitations

The prime assumptions of the research objectives/research questions, and the collection and treatment of the data are briefly discussed. First the assumptions are discussed followed by the limitations.

Assumptions

The assumptions of the research objectives/research questions were as follows:

- (1) The data producing sample of the population response to the telephone questionnaire on the Ready Reserve forces represents a census of the entire population.

- (2) The observations/responses received from each respondent are an accurate (true) indication of the number of Ready Reserve personnel in the various bases civil engineering organization.
- (3) It was generalized that the mission of all bases within each major command is the same.

Limitations

Data collected from the telephone questionnaire were limited to the bases in only six of the CONUS MAJCOMs and the USAFA.

Conclusion

This chapter discussed the methodology that was used to analyze the data that were collected to answer the two research objectives. The breadth of the study was discussed. Next, the data collection plan was discussed. Data were collected by two methods. First, existing data from the Air Force Engineering and Services Center Manpower Standard Study were used. Also, data were collected from six MAJCOMs (AFLC, AFSC, ATC, MAC, SAC, TAC) and the USAFA by means of a telephone questionnaire. In addition, the method for answering the research objectives/research questions was discussed. The analysis process consisted of using simple descriptive analysis to analyze the data collected for research objective one. Also, several Air Force regulations, and personal and telephone interviews were used to analyze research

objective two. Finally, the assumptions and limitations of the research objectives/research questions were discussed.

CHAPTER III

RESEARCH FINDINGS

Overview

The purpose of this chapter is to analyze the data obtained from the methods outlined in Chapter II and report the results. Data were gathered from a telephone questionnaire and an existing CONUS Sustaining Force Manpower Standard Study. The MAJCOMs (AFLC, AFSC, ATC, MAC, SAC, and TAC) and the United States Air Force Academy responded to the telephone questionnaire. The Air Force Engineering and Services Center provided the CONUS Sustaining Force Manpower Standard Study.

Significant results which relate to the four research questions stated in Chapter II are reported. Initially, the results and analysis of research questions 1.1 and 1.2 are presented. The analysis of these two research questions accomplishes research objective one. Next, the results and analysis of research questions 2.1 and 2.2 are presented. The analysis of these two research questions accomplishes research objective two.

Research Question 1.1

How many Ready Reserve personnel hold emergency essential (wartime) civilian positions in civil engineering?

Data from the telephone questionnaire was used to answer research question 1.1.

The answer to research question number 1.1 is used to determine the total number of emergency essential (wartime) civilian positions that are held by Ready Reserve personnel for the CONUS bases in the six MAJCOMs and the USAFA.

Tables 1A - 1G provide the results of the number of Ready Reserve personnel who hold emergency essential (wartime) civilian positions in the CONUS bases civil engineering organizations and the Air Force Academy. The CONUS bases are separated according to the six MAJCOMs. Additionally, the number of Ready Reserve personnel are separated according to the seven categories used in the telephone questionnaire. An example to explain the tables is provided. Hill Air Force Base is within the purview of the Air Force Logistics Command and has 35 civilians who are members of a Ready Reserve Unit, 5 civilians who are members of a National Guard Unit, 0 civilians who are Individual Mobilization Augmentees and Individual Ready Reserve, 1 civilian who is a member of the Retired Reserve and Standby Reserve, and 26 Retired Military personnel who occupy emergency essential (wartime) civilian civil engineering positions. Therefore, Hill Air Force Base has a total of 68 Ready Reserve personnel who hold emergency essential (wartime) civilian civil engineering positions. The remaining bases were analyzed in the same manner.

Table 1A

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Air Force Logistics Command (AFLC)					
Ready Reserve Categories	Bases				
	Hill	McClellan	Robins	Tinker	Wright-Patterson
Ready Reserve Unit	35	12	10	18	7
National Guard Unit	5	0	10	5	2
Individual Mobilization Augmentees	0	2	1	0	1
Individual Ready Reserve	0	0	4	0	3
Retired Reserve	1	5	0	1	5
Standby Reserve	1	5	0	1	5
Retired Military	26	28	19	7	39
Base Total	68	52	44	32	62

Table 1B

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Air Force Systems Command (AFSC)				
Ready Reserve Categories	Bases			
	Edwards	Eglin	Hanscom	Patrick
Ready Reserve Unit	2	2	3	4
National Guard Unit	0	0	0	1
Individual Mobilization Augmentees	0	0	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	0	0	0	0
Standby Reserve	0	0	0	0
Retired Military	5	9	6	8
Base Total	7	11	9	13

Table 1C

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Air Training Command (ATC)				
Ready Reserve Categories	Bases			
	Chanute	Columbus	Goodfellow	Keesler
Ready Reserve Unit	0	0	2	4
National Guard Unit	0	10	0	3
Individual Mobilization Augmentees	1	1	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	0	2	0	1
Standby Reserve	2	2	0	2
Retired Military	8	6	15	47
Base Total	11	21	17	57

Air Training Command (ATC) (cont.)				
Ready Reserve Categories	Bases			
	Laughlin	Lowry	Mather	Maxwell
Ready Reserve Unit	0	1	2	6
National Guard Unit	0	1	1	3
Individual Mobilization Augmentees	0	0	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	5	0	2	4
Standby Reserve	3	5	0	0
Retired Military	1	0	20	8
Base Total	9	7	25	21

Air Training Command (ATC) (cont.)			
Ready Reserve Categories	Bases		
	Reese	Sheppard	Williams
Ready Reserve Unit	2	1	1
National Guard Unit	0	0	3
Individual Mobilization Augmentees	0	0	0
Individual Ready Reserve	0	0	0
Retired Reserve	0	3	0
Standby Reserve	0	0	0
Retired Military	4	13	13
Base Total	6	17	17

Table 1D

Ready Reserve Personnel who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Military Airlift Command (MAC)				
Ready Reserve Categories	Bases			
	Altus	Andrews	Bolling	Charleston
Ready Reserve Unit	0	5	0	3
National Guard Unit	3	1	0	0
Individual Mobilization Augmentees	0	0	0	1
Individual Ready Reserve	0	1	0	0
Retired Reserve	0	5	0	3
Standby Reserve	0	0	0	0
Retired Military	10	7	7	17
Base Total	13	19	7	24

Military Airlift Command (MAC) (cont.)				
Ready Reserve Categories	Bases			
	Dover	Kirtland	Little Rock	McChord
Ready Reserve Unit	5	8	1	5
National Guard Unit	3	8	14	0
Individual Mobilization Augmentees	0	2	0	0
Individual Ready Reserve	0	1	5	0
Retired Reserve	0	1	0	0
Standby Reserve	0	0	0	0
Retired Military	8	18	60	1
Base Total	16	38	80	6

Military Airlift Command (MAC) (cont.)					
Ready Reserve Categories	Bases				
	McGuire	Norton	Pope	Scott	Travis
Ready Reserve Unit	1	4	2	3	11
National Guard Unit	2	0	1	0	1
Individual Mobilization Augmentees	2	0	0	0	0
Individual Ready Reserve	0	0	0	0	0
Retired Reserve	0	1	0	0	2
Standby Reserve	0	0	0	0	1
Retired Military	8	10	16	5	23
Base Total	13	15	19	8	38

Table 1E

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Strategic Air Command (SAC)				
Ready Reserve Categories	Bases			
	Barksdale	Beale	Blytheville	Carswell
Ready Reserve Unit	4	5	1	9
National Guard Unit	0	2	0	1
Individual Mobilization Augmentees	1	0	1	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	1	0	2	0
Standby Reserve	0	0	0	0
Retired Military	55	15	4	21
Base Total	61	22	8	31

Strategic Air Command (SAC) (cont.)				
Ready Reserve Categories	Bases			
	Castle	Dyess	Ellsworth	F. E. Warren
Ready Reserve Unit	0	1	0	3
National Guard Unit	0	0	0	5
Individual Mobilization Augmentees	0	0	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	0	2	0	1
Standby Reserve	0	1	0	1
Retired Military	8	5	0	9
Base Total	8	9	0	19

Strategic Air Command (SAC) (cont.)				
Ready Reserve Categories	Bases			
	Fairchild	Grand Forks	Grissom	K. I. Sawyer
Ready Reserve Unit	4	2	4	0
National Guard Unit	9	2	0	3
Individual Mobilization Augmentees	0	0	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	1	0	0	0
Standby Reserve	1	0	0	0
Retired Military	20	2	10	9
Base Total	35	6	14	12

Strategic Air Command (SAC) (cont.)					
Ready Reserve Categories	Bases				
	Malmstrom	March	McConnell	Minot	Offutt
Ready Reserve Unit	6	7	5	7	3
National Guard Unit	4	0	1	3	3
Individual Mobilization Augmentees	0	0	0	0	0
Individual Ready Reserve	0	0	0	0	0
Retired Reserve	0	0	1	0	2
Standby Reserve	0	0	0	0	0
Retired Military	12	22	14	0	30
Base Total	22	29	21	10	38

Strategic Air Command (SAC) (cont.)				
Ready Reserve Categories	Bases			
	Pease	Plattsburgh	Whiteman	Wurtsmith
Ready Reserve Unit	1	3	0	0
National Guard Unit	4	0	0	0
Individual Mobilization Augmentees	0	0	0	1
Individual Ready Reserve	1	0	0	0
Retired Reserve	3	0	0	0
Standby Reserve	0	0	0	0
Retired Military	11	5	11	0
Base Total	20	8	11	1

Table 1F

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Tactical Air Command (TAC)				
Ready Reserve Categories	Bases			
	Bergstrom	Cannon	England	George
Ready Reserve Unit	0	4	0	0
National Guard Unit	0	0	0	0
Individual Mobilization Augmentees	3	0	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	0	0	0	0
Standby Reserve	0	0	0	0
Retired Military	12	10	6	10
Base Total	15	14	6	10

Tactical Air Command (TAC) (cont.)				
Ready Reserve Categories	Bases			
	Holloman	Homestead	Hurlburt	Langley
Ready Reserve Unit	2	2	5	4
National Guard Unit	0	1	0	0
Individual Mobilization Augmentees	0	0	0	2
Individual Ready Reserve	0	0	0	0
Retired Reserve	0	2	0	2
Standby Reserve	0	0	0	0
Retired Military	12	15	10	15
Base Total	14	20	15	23

Tactical Air Command (TAC) (cont.)				
Ready Reserve Categories	Bases			
	MacDill	Moody	Mountain Home	Myrtle Beach
Ready Reserve Unit	2	0	5	2
National Guard Unit	0	0	1	0
Individual Mobilization Augmentees	0	0	0	0
Individual Ready Reserve	0	0	0	0
Retired Reserve	0	0	0	0
Standby Reserve	0	0	0	0
Retired Military	20	0	15	12
Base Total	22	0	21	14

Tactical Air Command (TAC) (cont.)			
Ready Reserve Categories	Bases		
	Nellis	Seymour-Johnson	Tyndall
Ready Reserve Unit	3	0	1
National Guard Unit	2	8	0
Individual Mobilization Augmentees	0	0	0
Individual Ready Reserve	0	0	0
Retired Reserve	1	0	0
Standby Reserve	0	0	0
Retired Military	25	10	15
Base Total	31	18	16

Table 1G

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

United States Air Force Academy (USAFA)	
Ready Reserve Categories	Air Force Academy
Ready Reserve Unit	12
National Guard Unit	2
Individual Mobilization Augmentees	0
Individual Ready Reserve	0
Retired Reserve	0
Standby Reserve	0
Retired Military	24
Academy Total	38

Table 1H provides the total number of emergency essential (wartime) civilian civil engineering positions occupied by Ready Reserve personnel for each MAJCOM and the USAFA. The results were obtained by summing the data elements in each category of tables 1A - 1G.

Table 1H

Ready Reserve Personnel Who Hold
Emergency Essential (Wartime)
Civilian Civil Engineering Positions

Major Command (MAJCOM)							
Ready Reserve Categories	Commands						
	AFLC	AFSC	ATC	MAC	SAC	TAC	USAFA
Ready Reserve Unit	82	11	19	48	65	30	12
National Guard Unit	22	1	21	33	37	12	2
Individual Mobilization Augmentees	4	0	2	5	3	5	0
Individual Ready Reserve	7	0	0	7	1	0	0
Retired Reserve	12	0	17	12	13	5	0
Standby Reserve	12	0	14	1	3	0	0
Retired Military	119	28	135	190	263	187	21
Command Total	258	40	208	296	385	239	38

Research Question 1.2

How do the Ready Reserve personnel Holding Emergency Essential (wartime) civilian positions in civil engineering affect existing CONUS Sustaining Force Manning Requirements?

To answer research question 1.2, data from the existing CONUS Sustaining Force Manpower Standard Study and results from research question 1.1 were used. Data from the CONUS Sustaining Force Manpower Standard Study provide the number of emergency essential (wartime) civilian civil engineering positions that are required to perform minimum operations and maintenance activities for the CONUS bases and the USAFA. Results from research question 1.1 provide the number of emergency essential (wartime) civilian civil engineering positions that are held by Ready Reserve personnel. The answer to research question 1.2 is expressed as the percentage of manpower shortage caused by the Ready Reserve personnel.

Tables 2A - 2G provide the manpower shortage that was created by members of the Ready Reserve Forces who hold emergency essential (wartime) civilian civil engineering positions for the CONUS bases and the USAFA. The bases were separated according to the six major commands. Also, the tables have five categories. These categories are base, CONUS Sustaining Force (CSF) manning requirements, Emergency Essential (E - E) positions that are held by members of the Ready Reserve Forces, net change, and percent of manpower shortage.

To familiarize the reader with the tables, an example is provided. McClellan Air Force Base, which is under the purview of the Air Force Logistics Command, has a CONUS Sustaining Force (CSF) manning requirement for 268 emergency essential (wartime) civilian civil engineering positions. However, 52 of the emergency essential positions are held by members of the Ready Reserve Forces. Therefore, only 216 emergency essential positions are filled with civilians who are not members of the Ready Reserve Forces. Thus, there exists a manpower shortage of 19% for McClellan Air Force Base. The remaining bases were analyzed in a similar manner.

Table 2A

Manpower Shortage Created By The Ready Reserve Forces

Air Force Logistics Command (AFLC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Reserve Forces	Net Change	Percent Manpower Shortage
	(A)	(B)	A - B	B/A
	(A)	(B)	(C)	(D)
Hill	288	68	220	23.6
McClellan	268	52	216	19.4
Robins	310	44	266	14.2
Tinker	273	32	241	11.7
Wright-Patterson	481	62	419	12.9
Command Total	1620	258	1362	15.9

Table 2B

Manpower Shortage Created By The Ready Reserve Forces

Air Force Systems Command (AFSC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E positions Held By Members Of The Ready Reserve Forces	Net Change	Percent Manpower Shortage
	(A)	(B)	A - B (C)	B/A (D)
Edwards	178	7	171	3.9
Eglin	218	11	207	5.0
Hanscom	150	9	141	6.0
Patrick	154	13	141	8.4
Command Total	700	40	660	5.7

Table 2C

Manpower Shortage Created By The Ready Reserve Forces

Air Training Command (ATC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Reserve Forces	Net Change	Percent Manpower Shortage
			A - B	B/A
	(A)	(B)	(C)	(D)
Chanute	257	11	246	4.3
Columbus	129	21	108	16.3
Goodfellow	104	17	87	16.3
Keesler	349	57	292	16.3
Laughlin	128	9	119	7.0
Lowry	301	7	294	2.3
Mather	172	25	147	14.5
Maxwell	197	21	176	10.7
Reese	125	6	119	4.8
Sheppard	315	17	298	5.4
Williams	140	17	123	12.1
Command Total	2217	208	2009	9.4

Table 2D

Manpower Shortage Created By The Ready Reserve Forces

Military Airlift Command (MAC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Reserve Forces	Net Change	Percent Manpower Shortage
	(A)	(B)	A - B (C)	B/A (D)
Altus	126	13	113	10.3
Andrews	205	19	186	9.3
Bolling	105	7	198	6.7
Charleston	156	24	132	15.4
Dover	182	16	166	8.8
Kirtland	187	38	149	20.3
Little Rock	161	80	81	49.7
McChord	153	6	147	3.9
McGuire	168	13	155	7.7
Norton	172	15	158	8.7
Pope	108	19	88	17.6
Scott	224	8	216	3.6
Travis	228	38	190	16.7
Command Total	2175	296	1879	13.6

Table 2E

Manpower Shortage Created By The Ready Reserve Forces

Strategic Air Command (SAC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Reserve Forces	Net Change	Percent Manpower Shortage
	(A)	(B)	A - B (C)	B/A (D)
Barksdale	169	61	108	36.1
Beale	154	22	132	14.3
Blytheville	125	8	117	6.4
Carswell	161	31	130	19.3
Castle	151	8	143	5.3
Dyess	106	9	95	8.5
Ellsworth	177	0	177	0.0
F. E. Warren	129	19	110	14.7
Fairchild	161	35	126	21.7
Grand Forks	160	6	154	3.8
Grissom	143	14	129	9.8
K. I. Sawyer	146	12	134	8.2

Table 2E (con't)

Manpower Shortage Created By The Ready Reserve Forces

Strategic Air Command (SAC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Forces Reserve	Net Change	Percent Manpower Shortage
	(A)	(B)	A - B (C)	B/A (D)
Malmstrom	148	22	126	14.9
March	161	29	132	18.0
McConnell	161	21	140	13.0
Minot	175	10	165	5.7
Offutt	316	38	278	12.0
Pease	143	20	123	14.0
Plattsburgh	126	8	118	6.3
Whiteman	136	11	125	8.1
Wurtsmith	126	1	125	0.1
Command Total	3274	385	2889	11.8

Table 2F

Manpower Shortage Created By The Ready Reserve Forces

Tactical Air Command (TAC)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Forces Reserve	Net Change A - B	Percent Manpower Shortage B/A
	(A)	(B)	(C)	(D)
Bergstrom	154	15	139	9.7
Cannon	115	14	101	12.2
England	102	6	96	5.9
George	129	10	119	7.8
Holloman	146	14	132	9.6
Homestead	135	20	115	14.8
Hurlburt	99	15	84	15.0
Langley	216	23	193	10.6

Table 2G

Manpower Shortage Created By The Ready Reserve Forces

United States Air Force Academy (USAFA)				
Manpower Shortage				
Base	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Reserve Forces	Net Change A - B	Percent Manpower Shortage B/A
	(A)	(B)	(C)	(D)
Air Force Academy	342	38	304	11.1
Total	342	38	304	11.1

Results of the total manpower shortage for each MAJCOM and the USAFA are presented in table 2H. These results were obtained by summing the data elements in each category of tables 2A - 2G.

Table 2H

Total Manpower Shortage Created By The Ready Reserve Forces

Major Commands				
Total Manpower Shortage				
Command	CSF Manning Requirements	E-E Positions Held By Members Of The Ready Reserve Forces	Net Change	Percent Manpower Shortage
	(A)	(B)	A - B (C)	B/A (D)
AFLC	1620	259	1361	16
AFSC	700	40	660	5.7
ATC	2217	208	2009	9.4
MAC	2175	296	1879	13.6
SAC	3274	385	2889	11.8
TAC	2036	239	1807	11.7
USAFA	342	38	304	11.1
Overall Total	12363	1465	10898	11.9

Analysis

The purpose of research objective 1.0 was to describe the manpower shortage that the Ready Reserve personnel will cause for the CONUS Sustaining Force Manning. Results of research questions 1.1 and 1.2, presented in Tables 1A - 1H and Tables 2A - 2H, were analyzed to support the first research objective. The analysis of research question 1.1 is discussed below, followed by a discussion of the analysis of research question 1.2.

Research Question 1.1

This discussion is confined to bases that have 20 or more emergency essential (wartime) civilian positions held by members of the Ready Reserve Forces. Bases with 20 or more emergency essential positions that are held by Ready Reserve personnel account for the greatest manpower shortage. Results from research question 1.1 revealed that 29 bases, including the Air Force Academy, have 20 or more emergency essential (wartime) civilian positions held by members of the Ready Reserve Forces. Each of the 29 bases is discussed according to its respective MAJCOM. Bases within AFLC are discussed first.

There are five bases within AFLC that have 20 or more emergency essential positions held by members of the Ready Reserve Forces. Hill AFB has 68 emergency essential positions that are held by members of the Ready Reserve Forces;

35 of the positions are held by members of a Ready Reserve Unit and 26 positions held by Retired Military personnel. Second, McClellan AFB has 52 emergency essential positions held by members of the Ready Reserve Forces; 28 of the positions are held by Retired Military personnel. Robins AFB has 44 emergency essential positions held by Ready Reserve personnel; 19 of the positions are held by Retired Military personnel. Next, Tinker AFB has 32 emergency essential positions that are held by members of the Ready Reserve Forces; 18 of the positions are held by members of the Ready Reserve Unit. Wright Patterson AFB has 62 emergency essential positions that are held by members of the Ready Reserve Forces; 39 of the positions are held by Retired Military personnel.

In ATC, there are four bases that have 20 or more emergency essential positions that are held by Ready Reserve personnel. First, Columbus AFB has 21 emergency essential positions held by members of the Ready Reserve Forces; 10 of the positions are held by members of the National Guard Unit. Second, Keesler AFB has 57 emergency essential positions held by members of the Ready Reserve Forces; 47 of the positions are held by Retired Military personnel. Next, Mather AFB has 25 emergency essential positions held by Ready Reserve personnel; 20 of the positions are held by Retired Military personnel. Maxwell AFB has 21 emergency essential positions that are held by Ready Reserve personnel; 8 of the positions are held by Retired Military personnel.

Within MAC, four bases have 20 or more emergency essential positions that were held by members of the Ready Reserve Forces. Charleston AFB has 24 emergency essential positions that are held by members of the Ready Reserve Forces; 17 of the positions are held by Retired Military personnel. Kirtland AFB has 38 emergency essential positions that are held by Ready Reserve personnel; 18 of the positions are held by Retired Military personnel. Little Rock AFB has 80 emergency essential positions that are held by Ready Reserve personnel; 60 of the positions are held by Retired Military personnel. Travis AFB had 38 emergency essential positions that are held by members of the Ready Reserve Forces; 23 of the positions are held by Retired Military personnel.

There are nine SAC bases that have 20 or more emergency essential positions that are held by members of the Ready Reserve Forces. Barksdale AFB has 61 emergency essential positions that are held by members of the Ready Reserve Forces; 55 of the positions are held by Retired Military personnel. Beale AFB has 22 emergency essential psotions that are held by members of the Ready Reserve Forces; 15 of the positions are held by Retired Military personnel. Carswell AFB has 31 emergency essential positions that are held by Ready Reserve personnel; 21 of the positions are held by Retired Military personnel. Futhermore, Farichild AFB has 35 emergency essential positions that are occupied by members of the Ready Reserve Forces; 20 of the positions are held by

Retired Military personnel. Malmstrom AFB has 22 emergency essential positions that are held by members of the Ready Reserve Forces; 12 of the positions are held by Retired Military personnel. March AFB has 29 emergency essential positions that are held by members of the Ready Reserve Forces; 22 of the positions are held by Military personnel. McConnell AFB has 21 emergency essential positions that are held by members of the Ready Reserve Forces; 14 of the positions are held by Retired Military personnel. Offutt AFB has 38 emergency essential positions that are held by members of the Ready Reserve Forces; 30 of the positions are held by Retired Military personnel. Finally, Pease AFB has 20 emergency essential positions that are held by members of the Ready Reserve Forces; 11 of the positions are held by Retired Military personnel.

In TAC, there are four bases that have 20 or more emergency essential positions that are held by members of the Ready Reserve Force. Homestead AFB has 20 emergency essential positions that are held by Ready Reserve personnel; 15 of the positions are held by Retired Military personnel. Langley AFB has 23 positions that are held by members of the Ready Reserve Forces; 15 of the positions are held by Retired Military personnel. MacDill AFB has 22 emergency essential positions that are held by members of the Ready Reserve Forces; 20 of the positions are held by Retired Military personnel. Next, Mountain Hill AFB has 21 emergency essential positions

that are held by Ready Reserve personnel; 15 of the positions are held by Retired Military personnel. Finally, Nellis AFB has 31 emergency essential positions that are held by members of the Ready Reserve Forces; 25 of the positions are held by Retired Military personnel.

The Air Force Academy has 38 emergency essential positions that are occupied by members of the Ready Reserve Forces; 24 of the positions are occupied by Retired Military personnel.

Overall, SAC has the majority of the emergency essential positions that are held by members of the Ready Reserve Forces. In decreasing order, the remaining MAJCOMs are MAC, AFLC, TAC, ATC, AFSC, and the USAFA. Results for the MAJCOMs and the USAFA were presented in Table 1H. Additionally, the results from research question 1.1 revealed that 934 of the emergency essential positions are held by Retired Military personnel.

Research Question 1.2

Research question 1.2 was used to determine the manpower shortage that the Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering caused in the CONUS Sustaining Force Manning requirements. Next, the analysis of the results of research question 1.2 is presented.

The results of research question 1.2, show that a manpower shortage exists for each MAJCOM (except AFSC and TAC) and the USAFA. The manpower shortage was determined according to the criterion that was established in Chapter II. The

following sections explain the manpower shortage as it pertains to each MAJCOM (except AFSC and TAC) and the USAFA.

Manpower Shortage for AFLC

A criterion was established that if the manpower shortage for AFLC bases was greater than 10%, the capability to effectively perform minimum essential operations and maintenance will not exist. Every AFLC base exceeded this figure. Wright-Patterson AFB has the lowest manpower shortage of 12.9%, while Hill AFB has the highest manpower shortage of 23.6%. Overall, AFLC has a manpower shortage of 16.0%.

Manpower Shortage for ATC

Again, a criterion was established that if the manpower shortage for ATC bases was greater than 5%, the capability to effectively perform minimum essential operations and maintenance activities will not exist. Analysis of the results indicates that three bases did not exceed this figure. These bases are Chanute, Lowry, and Reese. Lowry AFB has the lowest manpower shortage of 2.3%, while Columbus, Goodfellow, and Keesler AFB all have the highest manpower shortage of 16.3%. In addition, three other bases in ATC have a high manpower shortage. These bases are Mather (14.5%), Maxwell (10.7%), and Williams (12.1%). Overall, ATC has a manpower shortage of 9.4%.

Manpower Shortage for MAC

If the manpower shortage for MAC bases was greater than 10%, the capability to effectively perform minimum essential

operations and maintenance activities will not exist. The manpower shortage for MAC bases ranged from a low of 3.6% for Scott AFB to a high of 49.7% for Little Rock AFB. The 49.7% manpower shortage for Little Rock AFB is the highest for any of the bases used in this research. This indicates that almost 50% of Little Rock Air Force Base's emergency essential positions are held by civilians who are members of the Ready Reserve. Also, four other bases have a high manpower shortage. These bases are Charleston (15.4%), Kirtland (20.3%), Pope (17.6%), and Travis (16.7%). Overall, MAC has a manpower shortage of 13.6%.

Manpower Shortage for SAC

If the manpower shortage for SAC bases was greater than 5%, the capability to effectively perform minimum essential operations and maintenance activities will not exist. Analysis of the results indicates that three bases did not exceed this figure. These bases are Ellsworth (0%), Grand Forks (3.8%), and Wurtsmith (0.1%). Of the remaining SAC bases, Barksdale AFB has the highest manpower shortage of 36.1%. This indicates that a considerable number of Barksdale Air Force Base's emergency essential positions are occupied by civilians who are members of the Ready Reserve forces. Also, seven other SAC bases have a high manpower shortage: Carswell (19.3%), F.E. Warren (14.7%), Fairchild (21.7%), Malmstrom (14.9%), March (18%), Offutt (12%), and Pease (14%).

Manpower Shortage for USAFA

The criterion that was established for the USAFA is if the manpower shortage is greater than 10%, the capability to effectively perform minimum essential operations and maintenance activities will not exist. The USAFA exceeded this figure. The manpower shortage is 11.1%.

Research Objective One Summary

Overall, the percent of manpower shortage for the CONUS bases was 11.9%. Bases within AFLC have the highest percent of manpower shortage. The manpower shortage for this command is 16%. AFSC bases have the lowest percent of manpower shortage. The manpower shortage for this command is 5.7%. Since none of the AFSC and TAC bases exceeded the criteria that were established in Chapter II, their manpower shortage was not considered. Table 2H provides the percent of manpower shortage for each MAJCOM and the USAFA.

Research Question 2.1

How do the civilian personnel regulations address the problem of Ready Reserve personnel holding emergency essential (wartime) positions?

AFR 40-910 was used to answer research question 2.1. Ready Reserve personnel who are obligated to report for active military duty during a national emergency (major conventional war overseas) cannot hold emergency essential positions (AFR 40-910, 1982, p. 13). According to AFR 40-910

(1982), there are four circumstances that prevent an incumbent from being identified as a emergency essential employee.

The circumstances are as follows:

- (1) The incumbent of the emergency essential position is a member of the Ready Reserve and therefore is subject to an early recall to active military service in the event of a mobilization.
- (2) The incumbent of the emergency essential position is a member of the Standby Reserve or is a military retiree under age 60 who did not retire for disability. These employees must be removed from their military recall status when the conditions for screening are met.

Note: The above provision permits Standby Reservists and Military Retirees to be E-E employees when the position is not key and they sign AF Form 2090. If they are removed from their military recall status, they may serve in key positions.

- (3) The incumbent of the emergency essential position would not be able to perform the duties of the position in an emergency because of factors such as physical disability, medical condition, religious belief and humanitarian reasons.
- (4) The incumbent of the emergency essential position elects not to sign AF Form 2090. AF Form 2090 is a civilian employee emergency essential position agreement.

Research Question 2.2

What are ways of filling vacancies created by Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering?

There were four component questions used to answer research question 2.2. The first component question was "Can vacancies be filled with civil engineering personnel from the Individual Mobilization (IMA) program? AFR 35-34 and USAF Engineering and Services Individual Mobilization and

Augmentee Program Management Plan were used to provide this answer. According to AFR 35-34 (1982), the purpose of IMAs is to fill any deficit between peacetime and wartime military requirements. IMAs are expected to step in directly and carry forward pertinent civil engineering activities during an emergency (USAF Engineering and Services, 1982, p. 3). IMAs may be called upon to replace an active duty member who is called to deploy or to augment on-going activities where the surge of the war effort may call for additional manpower (USAF Engineering and Services, 1982, p. 3). Therefore, IMAs cannot be used to fill vacated emergency essential civilian positions.

The second component question was "Are overhires appropriate?" AFRs 26-1 and 26-2, and a telephone interview were used to answer this question. The two regulations did not reveal whether the same criteria for obtaining civilian overhires during peacetime apply to a wartime situation. In a telephone interview with Lieutenant Farren of the Management Engineering Team (MET 30), it was determined that the same criteria for obtaining overhires for peacetime apply to wartime. According to Lieutenant Farren (1983), the criteria for obtaining civilian overhires are:

- (1) Identify manning requirements.
- (2) Forward manning requirements to civilian personnel for review.
- (3) MET reviews and either approves or disapproves manning requirements.

- (4) Comptroller ensures funding is available for approved manning requirements.
- (5) Obtain civilian overhires.

Thus, civilian overhires are appropriate for filling emergency essential civilian positions that are vacated by members of the Ready Reserve Forces.

The third component question was "Will retraining (changing from one AFSC to another) be appropriate?" AFR 40-430 and a personal interview were used to answer this question. According to AFR 40-430 (1966), retraining of civilian employees is used to meet projected manpower requirements in anticipated new or shortage skills categories. It is determined that retraining is an appropriate means of filling vacated emergency essential civilian positions.

According to Mr. Carter (1983), even though retraining is an appropriate means of filling vacated emergency essential civilian positions, there will be some limitations to retraining during a major conventional war. First, the retraining period will be shorter. Next, retraining will be limited to key techniques that are necessary to get the job done. Finally, much of the retraining will be limited to On-the-Job Training (OJT).

Review of AFR 40-430 and the personal interview revealed that the same criteria for retraining civilians in peacetime apply to wartime. These criteria are as follows:

- (1) Employee(s) must be serving under a career or career-conditional appointment or under an equivalent appointment in an excepted position.
- (2) Participation in retraining must be with the employee's consent.
- (3) Employee(s) must have either an occupational skill related to the position for which retraining is to be conducted, or the basic aptitudes necessary for successful completion of the training within a reasonable time (AFR 40-430, 1966, p. 3).

As previously mentioned, retraining is an appropriate means for filling emergency essential civilian positions that are vacated by members of the Ready Reserve Forces.

The final component question was "Can civilian contractors be used to fill vacancies that are created by Ready Reserve personnel?" AFR 70-7 and a personal interview were used to answer this question. AFR 70-7 provided no provisions for employing civilian contractors during a major conventional war overseas. According to Mr. Wickizer (1983), the same procedures used to employ civilian contractors during peacetime (governed by public law) will be used during wartime.

Civilian contractors can be used to fill vacated emergency civilian positions. However, there is a certain stipulation for the use of civilian contractors to fill vacated emergency essential civilian positions. If a civilian contractor is used to fill a vacated emergency essential civilian position, the entire functional area where the position is vacant must be contracted out (Wickizer, 1983). For example, if an emergency essential civilian position is vacant

in the exterior electric shop and can be filled only by a civilian contractor the remaining positions that are filled by government employees must be contracted out. This is because civilian contractors cannot have government supervision (Wickizer, 1983).

Analysis

Research questions 2.1 and 2.2 were used to accomplish research objective 2. The purpose of research objective 2 was to determine ways to compensate for manning shortfalls due to Ready Reserve personnel holding emergency essential positions. The analysis of research question 2.1 is discussed, followed by a discussion of research question 2.2.

Research Question 2.1

Results from research question 2.1 revealed that only Standby Reservists and military retirees (not yet age 60 or retired because of disability) are allowed to hold emergency essential positions as long as the positions are not key. In reviewing tables 1A - 1H and Tables 2A - 2H, the adjusted manpower shortage for each MAJCOM and the USAF are: AFLC 8.1%, AFSC 4.0%, ATC 6.7%, MAC 8.8%, SAC 8.1%, TAC 9.2%, and USAFA 7.0%. An example is provided to explain the adjusted manpower shortage. Within AFLC, only the emergency essential positions that are held by Standby Reservists and Retired Military personnel are considered for the adjusted manpower shortage. For the five bases within AFLC there are

a total of 12 emergency essential positions held by Standby Reservists and 119 positions held by Retired Military personnel for an adjusted total of 131 positions. The adjusted manpower shortage is determined by dividing the adjusted total by AFLC's CONUS Sustaining Force Manning Requirements (131/1620). Thus the adjusted manpower shortage for AFLC is 8.1%. The adjusted manpower shortage for the remaining MAJCOMs and the USAFA is determined in the same manner. There still exists a manpower shortage in ATC and SAC.

Research Question 2.2

Results from research question 2.1 revealed that only three of the four ways to fill vacated emergency essential civilian positions are appropriate. First, overhires are appropriate for filling vacated emergency essential civilian positions. The same criteria for obtaining overhires during peacetime apply to wartime. Retraining is another way of filling vacated emergency essential civilian positions. The retraining criteria are the same for both peacetime and wartime. Results revealed that the retraining process would be shorter during wartime. The third means to fill vacated emergency essential civilian positions is through the use of civilian contractors. Results revealed this means is appropriate. However, if a civilian contractor is used, the entire functional area must be contracted out.

Results revealed that IMAs cannot be used to fill vacated emergency essential civilian positions. This is because

the purpose of IMAs is to augment the active duty military force during an emergency.

Research Objective Two Summary

Overall, only two MAJCOMs (ATC and SAC) still have a manpower shortage that exceeded the criteria established in Chapter II. This was due to the criteria contained in AFR 40-910. Only Standby Reservists and military retirees can hold emergency essential positions. Three of four ways to fill vacated emergency essential civilian positions are appropriate.

Conclusion

This chapter discussed the findings and analysis of the four research questions of Chapter 1. First, research question 1.1 was discussed, followed by research question 1.2. Research question 1.1 was used to determine the number of Ready Reserve personnel who occupy emergency essential (wartime) civilian positions in civil engineering. Research question 1.2 was used to determine the manpower shortage that the Ready Reserve personnel holding emergency essential positions in civil engineering caused in the CONUS Sustaining Force Manning requirements. Finally, research questions 2.1 and 2.2 were discussed. These two questions were used to determine ways to fill vacancies created by Ready Reserve personnel.

CHAPTER IV
CONCLUSIONS/RECOMMENDATIONS

Overview

The purpose of this chapter is to present the conclusions drawn from Chapter III, and present recommendations for further research.

Conclusions

The two research objectives of this research effort stated in Chapter I were:

- (1) Describe the manpower shortage that the Ready Reserve personnel will cause for the CONUS Sustaining Force manning.
- (2) Determine ways to compensate for manning shortfall due to Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering, if the manning shortfall has a significant effect on existing CONUS Sustaining Force manning requirements.

Answers to research questions 1.1 and 1.2 were analyzed to obtain information in support of the first research objective. The results were reported in Chapter III. For the

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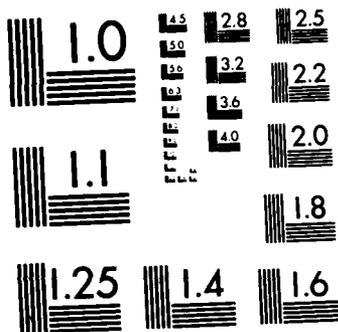
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second research objective, research questions 2.1 and 2.2 were analyzed and the results of the analyses were also reported in Chapter III. The purpose of this section is to state the conclusions reached on the two research objectives.

Research Objective One

Describe the manpower shortage that the Ready Reserve personnel will cause for the CONUS Sustaining Force manning.

The research questions used to evaluate the first research objective indicated that a manpower shortage exists for four MAJCOMs (AFLC, ATC, MAC, SAC) and the USAFA. The majority of the bases within each MAJCOM exceeded the manpower shortage criteria that were established in Chapter II. However, only three MAJCOMs (AFLC, ATC, AND SAC) appear to have serious manpower shortages. The MAJCOMs exceeded their established manpower shortage range by 50% or more. Also, it appears that a considerable number of the emergency essential positions are held by Retired Military personnel. It was anticipated that many of the emergency essential positions would be held by members of a Ready Reserve Unit or National Guard Unit. This was not the case. It appears that the manpower shortage for the CONUS bases ranged between 10% and 15%, with some exceptions.

Research Objective Two

Determine ways to compensate for manning shortfall due to Ready Reserve personnel holding emergency essential (wartime) civilian positions in civil engineering, if the manning shortfall has a significant effect on existing CONUS Sustaining Force manning requirements.

Results from research objective one revealed that the manpower shortage for the MAJCOMs and the USAFA has a significant effect on the existing CONUS Sustaining Force manning requirements. The research questions used to evaluate the second research objective indicated that there are some appropriate ways to compensate for manning shortfall (filling emergency essential civilian positions that are vacated by Ready Reserve personnel). Results from Chapter III revealed that only Standby Reservists and military retirees can hold emergency essential positions as long as the positions are not key. With this being the case, it appears that only two MAJCOMs (ATC and SAC) still have a manpower shortage. There appears to be a considerable amount of ambiguity in AFR 40-910 pertaining to Ready Reserve personnel holding emergency essential civilian positions.

To compensate for the manpower shortage for ATC and SAC, four ways of filling vacated emergency essential civilian positions were reviewed. IMAs cannot be used to fill vacated emergency essential civilian positions.

Civilian overhires are considered as the first means of filling vacated emergency essential civilian positions.

Results in Chapter III revealed that the same criteria for obtaining civilian overhires in peacetime are used for wartime. It was expected that different criteria would apply for wartime situations. The next method for filling vacated emergency essential civilian positions is retraining (changing from one AFSC to another).

As a last resort, civilian contractors can be used to fill vacated emergency essential civilian positions. Civilian contractors are appropriate; however, it appears that the entire functional area where the contractor will be used must be contracted out. The author expected that specific policies and guidance would be found to employ civilian contractors during a major conventional war; this was not the case. The same criteria used during peacetime apply to wartime.

Recommendations for Further Research

This study has shown that Ready Reserve personnel who hold emergency essential positions will cause a manning shortfall in the CONUS Sustaining Force manning requirements. This is the only phase of the CONUS Sustaining Force Concept that has been reviewed. Further research in the following areas is needed, which could lead to improvements in the CONUS Sustaining Force Concept:

- (1) Identify the number of key emergency essential (wartime) civilian civil engineering positions that are held by Standby Reservists and Retired

Military personnel and determine what effect this would have on the existing CONUS Sustaining Force manning requirements.

- (2) Develop an adequate training plan to assure that the CONUS Sustaining Forces are capable of performing minimum essential Operations and Maintenance activities during contingency conditions. Such issues as specialized training (for example, decontamination, damage assessment, shelter management, etc.), night time operations, and overtime need addressing.
- (3) Develop a working plan that can be used to implement the CONUS Sustaining Force Concept during a major conventional war overseas. This plan should be applicable to all CONUS bases.

APPENDICES

APPENDIX A

WORK CENTER DESCRIPTION

Civil Engineering -- CONUS Sustaining (Wartime)

DESCRIPTION SUMMARY

According to Captain Coullahan and others (1982), the following is a general narrative description of the work centers' functional responsibilities.

CIVIL ENGINEERING -- All activities related to the overall management of the Civil Engineering function, to include the Base Civil Engineer.

CIVIL ENGINEERING UNIT ADMINISTRATION -- All activities related to the Headquarters Squadron or Squadron Section Commander, the First Sergeant and other Unit Administration Personnel.

CIVIL ENGINEERING ADMINISTRATION MANAGEMENT -- All activities related to the overall administrative management of base Civil Engineering function; includes control and distribution of correspondence and maintenance of publication for BCE.

INDUSTRIAL ENGINEERING -- All activities related to the professional industrial engineering services and technical assistance to the Base Civil Engineer and staff for improving resource utilization and increasing work force productivity.

REAL ESTATE/COST ACCOUNTING -- All activities related to real property accounting and reporting and Civil Engineer cost accounting.

FAMILY HOUSING MANAGEMENT -- All activities related to the management of family housing assets, excluding furnishings. Accomplishes all functions associated with family housing assignments, control, utilization, referral, and inspection.

FINANCIAL MANAGEMENT -- All activities related to developing, preparing, submitting and maintaining the financial plan and budget estimates. Advises on all financial matters and maintains liaison with comptroller on current financial plan, budget estimates (CE portion), operations and maintenance

program, annual and long-range work plans and master plan. Prepares CE emergency plans, operations plans and annexes.

ENGINEERING AND ENVIRONMENTAL PLANNING -- All activities related to the management and preparation of technical data, studies, and evaluations of facilities and systems in support of mission requirements and environmental planning.

ENGINEERING-TECHNICAL AND DESIGN -- All activities related to the preparation, coordination, and design of projects (plans, specification and cost estimates) for contract execution. Performs engineering studies, furnishes technical assistance, operates drafting section, performs land surveys, prepares engineering portion of master plan. Maintains facility and systems record drawings.

CONTRACT MANAGEMENT -- All activities related to the work under contract. Performs testing, assists in final acceptance of military construction, and initiates design deficiency reports. Provides technical advice on proposed construction as well as on changes to and repair of existing facilities.

ENVIRONMENTAL AND CONTRACT PLANNING -- All activities related to community, comprehensive, land use, and natural resources planning, environmental protection, and pollution abatement and control. Implements policies and programs to (1) protect and improve the natural resources of air, water and land, (2) prevent, abate and control deterioration or pollution of the environment, (3) conserve and effectively utilize soil, water, vegetation, fish and wildlife and man-made resources. Responsible for plans and programs of work done by contract.

OPERATIONS -- All activities related to the direction, coordination, and control of the performance of all work approved and authorized for accomplishment by Civil Engineering work force.

FAMILY HOUSING MAINTENANCE-SUPERVISION -- All activities related to the supervision of maintenance, repair, and minor construction of family housing units.

MEDICAL FACILITY MAINTENANCE-SUPERVISION -- All activities related to the supervision of maintenance, repair and minor construction of medical facilities. This work center is authorized only if a separate medical facility maintenance section is organized in accordance with AFR 26-2.

RESOURCES AND REQUIREMENTS -- All activities involved in managing work requirements and tasking work centers to do the work. Prepares CE emergency plans, operations plans, and annexes. Directs all material control and planning functions and production control activities.

PRODUCTION CONTROL -- All activities involved with in-service work including development of the in-service work plan and BCE weekly work schedule. Operates customer service unit, service call function and controls DIN (Do-It-Now) vehicles. Manages the warranty/guarantee program.

PLANNING -- All activities involved with Production Control in preparing work plans. Determines layout, measurements, material, equipment, and other essential data required for work proposed. Plans labor and material requirements and cost estimates.

READINESS AND LOGISTICS -- All activities related to readiness, Prime BEEF, and disaster preparedness. All activities related to logistics support. Manages all material control activities.

PAVEMENTS AND GROUNDS -- All activities related to the supervision of the Civil Engineering work force engaged in the maintenance and repair of grounds and the maintenance, repair, and construction of all types of pavements as authorized.

CIVIL ENGINEERING EQUIPMENT OPERATIONS -- All activities related to the operation of assigned Civil Engineering base maintenance equipment (graders, dump trucks, bulldozers, and other authorized equipment).

PAVEMENTS -- All activities related to the maintenance and repair of all pavements. Construct new pavements when authorized. Responsible for all pavements, regardless of surface, no matter how stabilized, including airfield pavements, gravel roads, and sidewalk.

GROUNDS MAINTENANCE -- All activities related to the performance of landscaping and grounds maintenance and repair. Install drainage systems. Provides erosion control.

STRUCTURES -- All activities related to the supervision of the portion of the Civil Engineering work force engaged in structural, masonry, protective coating (coating), plumbing, and metal work.

STRUCTURAL MAINTENANCE -- All activities related to structural maintenance on facilities and installed equipment including installation, repair and replacement of doors, windows, screens and other wooden items. Installs and repairs fences. Provides locksmith service. Erects steel structures.

PROTECTIVE COATING (PAINTING) -- All activities related to all types of protective coating applications, paint sealer, primer, tape wrappings, and other coating materials. Paints signs, applies airfield and road traffic markings.

PLUMBING -- All activities relate to plumbing maintenance and repair on facilities and installed equipment. Removes, replaces, repairs and installs interior water lines, gas lines, drains, waste traps, valves, faucets and plumbing fixtures. Assists water and waste and heating sections in repair and maintenance of exterior water and steam lines as required.

METAL WORKING -- All activities related to metal and welding repair and maintenance on facilities and installed equipment. Manufactures, repairs and installs sheet metal products. Uses soldering and electric/gaseous welding to repair or manufacture metal items.

MASONRY -- All activities related to maintenance and repair of masonry components of facilities. Constructs and maintains facilities.

MECHANICAL-CIVIL ENGINEERING -- All activities related to the supervision of operation, maintenance, and repair of refrigeration and air conditioning units, plants and systems, air compressor, heating units, and ice plants.

REFRIGERATION AND AIR CONDITIONING -- All activities related to the maintenance and repair of refrigeration and air conditioning systems. Repairs walk-in and household refrigerators, heat pumps and refrigeration or air conditioning components. Operates air conditioning systems, mechanical ventilation systems, dehumidifying systems, evaporative systems, cold storage plants, ice manufacturing plants and air compression systems. Includes maintenance and repair work in instruments and controls.

LIQUID FUEL SYSTEM MAINTENANCE -- All activities related to the maintenance and repair of liquid fuel systems and installed equipment. Repairs leaks, performs cleaning operation on tanks, lines, and dispensing system. Repairs/maintains strainers, separators, valves, pumps and associated components. Includes maintenance and repair of instruments and controls.

HEATING SYSTEMS -- All activities related to the installation, maintenance and repair of heating systems including exterior distribution lines. Operates central and auxiliary plants and separate units when required. Supervises coal storage and performs tests of coal products. Maintains operating logs and other required records. Includes maintenance and repair of instruments and controls.

SYSTEMS MANAGEMENT -- All activities related to the supervision of energy monitoring and control system (EMCS) operation, maintenance and repair.

EMCE OPERATIONS -- All activities related to the operation and monitoring of the EMCS console which provides surveillance and operational control of real property systems. Includes analysis of system and equipment failure to determine probable causes and corrective action.

INSTRUMENT CONTROL -- All activities related to maintenance and repair of instruments and controls which are components of real property systems.

ELECTRONIC CONTROL -- All activities related to the maintenance and repair of electronic systems.

ELECTRICAL-CIVIL ENGINEERING -- All activities related to the maintenance, repair, replacement and installation of interior electrical systems, facilities and appliances.

INTERIOR ELECTRICAL -- All activities related to the maintenance, repair, replacement, and installation of interior electrical systems. Inspects, repairs, and replaces electric monitors, electric powered or operated equipment, and provides interior relamping service. Assists power production in the repair of power plant generators. Repairs and maintains electrically/electronically operated instruments.

EXTERIOR ELECTRICAL -- All activities related to the maintenance, repair, replacement, and installation of exterior lighting and electrical transmission systems. Installs, repairs, replaces, maintains airfield lighting systems and equipment. Provides exterior relamping service.

ELECTRICAL POWER PRODUCTION -- All activities related to the repair, maintenance, and installation of electric power production equipment such as gasoline and diesel engines, generators, heat recovery units, starter motors, and associated electrical power production plants and equipment, maintains operation inspection

and maintenance records. Performs maintenance and repair of aircraft arresting barriers, which includes cables, webbing, gears, pulleys, motors, and controls.

SANITATION -- All activities related to the supervision and coordination of the maintenance, repair, installation and operation of water and waste disposal plants and systems. Supervises entomology, refuse collection/disposal and custodial services.

WATER AND WASTE -- All activities related to the operation, maintenance, repair, and installation of water supply, processing, and treatment plants and systems, waste processing plants and systems including exterior distribution and collection systems.

CUSTODIAL SERVICES -- All activities related to providing janitorial and related services which includes waxing, polishing, sweeping, cleaning, and mopping floors, cleaning toilet rooms and plumbing fixtures, dusting and cleaning furniture, and woodwork. Removes trash from the building.

ENGINEER ENTOMOLOGY -- All activities related to providing services to destroy insects, arthropods, fungi, rodents, and miscellaneous animal pests. Performs fumigation, disinfection, insecticide and rodenticide application and inspection service as required.

REFUSE COLLECTION AND DISPOSAL -- All activities related to the collection and disposal of refuse. Operates load packer trucks, dumpsters, haulers and other pickup equipment. Operates incinerators, burn pits, sanitary landfills, and other facilities for disposal of garbage and refuse.

APPENDIX B
BASES USED IN RESEARCH

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