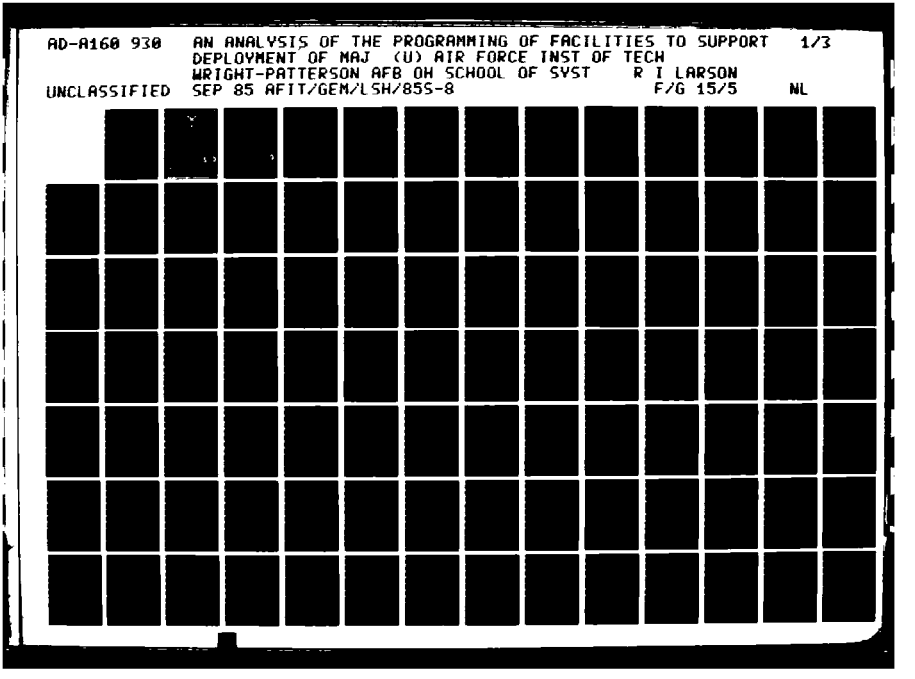
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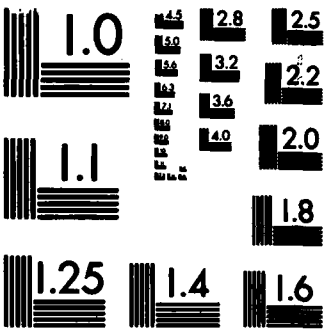

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AN ANALYSIS OF THE PROGRAMMING OF FACILITIES TO SUPPORT DEPLOYMENT OF MAJOR NEW WEAPON SYSTEMS

THESIS

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AFIT/GEM/LSH/85S-8

AN ANALYSIS OF THE PROGRAMMING OF FACILITIES TO SUPPORT DEPLOYMENT OF MAJOR NEW WEAPON SYSTEMS

THESIS

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

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— Ruth I. Larson

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Abstract

The primary purpose of this investigation was to evaluate the effectiveness of the process by which facilities are programmed to support major new weapon systems. The study used personal interviews to obtain the perceptions of fifty-one authorities in the fields of systems acquisition and facilities acquisition at the five organizational levels, from the base level to HQ USAF. Data collection was concentrated in four major areas: (1) the B-1B bomber, (2) the Peacekeeper missile, (3) Policy and Programs, and (4) Simulators.

Results of the study indicate that five areas are perceived as being major concerns: (1) timely identification of facility requirements, (2) the timing of the Military Construction Program in relation to the systems acquisition cycle, (3) funding concerns, (4) communication and coordination problems, and (5) political concerns. Some significant differences in the perception of problem areas also appear to exist between organizational levels.

The conclusions and recommendations of the study were based on both the results of the interviews and an extensive review of the current literature relating to the systems and facilities acquisition processes. These results

indicate that although some corrective actions can be accomplished within the existing system, many of the problems would require legislative or organizational changes to more closely integrate the systems and facilities acquisition processes.

AN ANALYSIS OF THE PROGRAMMING OF FACILITIES TO SUPPORT DEPLOYMENT OF MAJOR NEW WEAPON SYSTEMS

I. Introduction

Chapter Overview

This chapter contains general background on the weapon systems acquisition process, the facilities acquisition process, and the problems experienced in coordinating the two. The specific problem investigated, the research objectives, and the research questions are listed. The chapter also includes the scope and limitations of the study.

Background

One of the key goals of the Reagan Administration's defense policy is the modernization of United States defense forces. Examples of this modernization include the B-1B strategic bomber and the Peacekeeper missile. These new weapon systems are a critical element of the Administration's plan to rebuild both conventional and nuclear forces.

While much of the current debate surrounding these weapon systems focuses on the weapons themselves, relatively little has been said about the resources needed to

support these systems. Introduction of a new weapon system into the Air Force inventory requires a substantial expenditure of resources to provide such items as spare parts, support equipment, maintenance personnel, training, and facilities to house these functions.

Each of these logistics support requirements is obtained through a process entirely separate from the one used to develop and procure the weapon system itself. Therefore, it is essential that the support functions be closely coordinated with the systems acquisition process to assure that each of these elements will be ready when the first of these systems is deployed operationally. In particular, the long lead times associated with the Military Construction Program make it essential that the support facilities be considered early in the systems acquisition cycle.

Although the Air Force has instituted a number of procedures by which logistics support requirements are identified, coordination problems can still occur. For example, the problems associated with selection of the Peacekeeper basing mode made it extremely difficult to identify facility requirements. Also, the programming of certain B-1B support facilities was hampered by the fact that only limited logistics support planning was done during the earlier B-1A program. These examples, in two of the most visible new weapon systems in the Department of

Defense, suggest that there may be similar problems among other, less-visible programs.

The resources involved in force modernization are substantial: roughly half of the entire defense budget is used to support systems and equipment in the field (15:11). To ensure that such resources are used effectively, it is vital that logistics support be closely coordinated with the weapon systems acquisition process.

Statement of Problem

The purpose of this study was to determine the effectiveness of the Military Construction Program in providing support facilities in time for the deployment of major new weapon systems, and to identify those factors which contribute to any limitations of the program.

Research Objectives

The overall objective of this research was to gather sufficient data from interviews with members of the Air Force systems and facilities acquisition communities to identify major problem areas and to propose recommendations for future improvements in the facilities acquisition process. To achieve these goals, the following research sub-objectives guided the investigation:

1. Determine how the present systems and facilities acquisition processes operate.

2. Collect the opinions of key systems and facilities personnel concerning major problem areas in the facilities acquisition process.

3. Collect suggestions from systems and facilities personnel concerning the ways in which the processes might be improved.

4. Identify what, if any, differences exist in the perceptions of problem areas and proposed solutions between organizational levels.

5. Synthesize the data collected from systems and facilities acquisition personnel into recommendations to improve the facilities acquisition process.

Research Questions

To accomplish the research objectives, data were collected to answer the following research questions:

1. What are the major problem areas relating to facilities acquisition to support major new weapon systems?

2. How does the timing of the systems acquisition process affect the facilities acquisition process?

3. What temporary solutions to these problems have been tried or proposed?

4. What role do political influences play in the facilities acquisition process?

5. What near-term and long-term solutions could be offered to correct these facility acquisition problems?

Scope and Limitations of the Study

The research was limited to major new Air Force systems deployed within the continental United States. The study was also concerned primarily with deployments to operational bases. While facilities for testing, training, and depot maintenance were discussed in some interviews, these topics were used only to provide additional support for issues relating to the operational facilities.

The study was also limited to the programming portion of the facilities acquisition process, which consists primarily of developing suitable documentation of construction project requirements to receive funding approval from Congress. This phase will be considered in more detail in the following chapter. Problems encountered during the requirements identification, design, and construction phases were not specifically addressed during the research. However, they could serve as the basis for future research.

Finally, this study considered the programming of only direct support facilities, such as hangars, squadron operations facilities, and maintenance facilities, needed before a weapon system can become operational. It did not address indirect support facilities related to the large influx of people to a base which occurs with the deployment of a new weapon system. This restriction therefore

excluded programming to meet increases in facilities such as base exchanges, commissaries, hospitals, and military family housing.

II. Literature Review

Chapter Overview

This chapter presents a review of literature related to the processes of systems and facilities acquisition. The initial part of the chapter is devoted to presentation of broad overviews of the processes under consideration, while the remainder of the chapter discusses more specific problem areas associated with each process.

To provide a basic understanding of these processes, the chapter covers the following topics:

1. The five phases of the weapon systems acquisition process
2. Integrated Logistics Support
3. The four phases of the facilities acquisition process
4. The Planning, Programming, and Budgeting System
5. Alternative Methods of Facility Acquisition
6. The Acquisition Improvement Program
7. The Two-Year Federal Budget

The Weapon Systems Acquisition Process

The basic weapon systems acquisition process consists of five phases: 1) the Concept Exploration phase, 2) the Validation-Demonstration phase, 3) the Full-Scale Development phase, 4) the Production phase, and 5) the Deployment phase (1:81; 45:13; 58:14). The process is illustrated in Figure 2.1. The total systems acquisition process may take as long as 18 years to complete (56:60), but the average time required to develop a major weapon system is 12 to 13 years (91:36).

While the basic acquisition process is essentially the same for all weapon systems, the process described here will be for major weapon systems. Criteria for a major system are set forth in the Office of Management and Budget Circular A-109, "Major Systems Acquisition":

> A major system is that combination of elements that will function together to produce the capabilities required to fulfill a mission need. The elements may include, for example, hardware, equipment, software, construction, or other improvements on real property. (35:3)

The Office of Secretary of Defense provides additional criteria: a program is considered to be "major" if the estimated costs for Research and Development, Testing and Evaluation exceed $200 million and/or procurement exceeds $1 billion, based on FY 80 dollars (58:17). A program can also be declared "major" if it is of special interest to Congress (58:17).

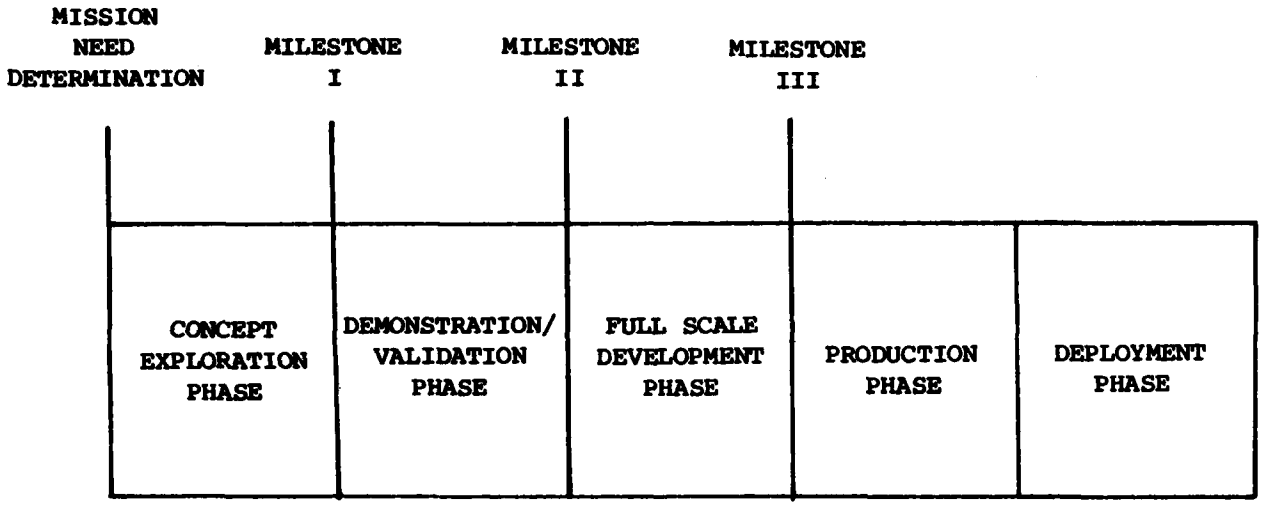


Fig. 2.1. The Weapon Systems Acquisition Process

The Five Phases of the Weapon Systems Acquisition Process. The systems acquisition process actually begins before the concept exploration phase. First, the appropriate Major Air Command (MAJCOM) must identify the requirement for a particular program based on a projected threat (1:80) or the obsolescence of an existing system (58:15). This requirement is documented in a Statement of Operational Need (58:15). For major programs, this initial need determination is "based upon an evaluation of a Justification of Major System New Start" (58:17). The Justification of Major System New Start is then included in the service's annual Program Objective Memorandum (58:17). The Secretary of Defense's decision to include a new system in the DOD budget authorizes the service to begin the concept exploration phase (58:17).

The Concept Exploration Phase. This phase is focused primarily on the identification and exploration of various alternatives by which the stated need can be met (1:81; 58:19). It is important to note that the Air Force does not specify exactly what system characteristics it wants; instead, it simply distributes a Request For Proposal to various potential contractors, and asks them to devise a system which will meet the identified need (58:19). Each offeror is then free to propose his own technical approach and design features (58:19-20).

Each of the prospective systems is then evaluated based on "technology, support, operations, and maintenance concepts, as well as the relative life-cycle costs" (58:20), and the most promising prospects are selected. The Secretary of the Air Force then requests approval for these systems to move into the second development phase, known as Demonstration/Validation (58:20). This approval process has been formally designated as Milestone I, the Requirement Validation Decision (58:20). Milestone I includes a series of reviews by the various levels of the Defense Board Structure. The Secretary of the Air Force's recommendation is documented in a System Concept Paper (58:20), which is reviewed by the Air Force Systems Acquisition Review Council (AFSARC) and the Defense Systems Acquisition Review Council (DSARC) (58:20-23), discussed below. The final decision in Milestone I is then made by the Secretary of Defense (58:20-23).

The AFSARC and DSARC play important roles in the systems acquisition process. The AFSARC serves as an advisory body to the Secretary of the Air Force for major systems acquisitions (58:21). "The AFSARC reviews all major systems acquisition programs at Milestones I, II, and III" (58:23). Reports from these reviews are presented to the Secretary of the Air Force, who then makes his recommendations to the chairman of the DSARC.

The responsibility of the DSARC is similar to that of the AFSARC. It serves as an advisory body to the Secretary of Defense for major systems acquisitions, and is responsible for reviewing major systems acquisition issues identified by the Defense Acquisition Executive (58:21). "Formal DSARC reviews are normally held at Milestones I and II" of the systems acquisition cycle (58:23). The DSARC will generally recommend one of the following alternatives to the Secretary of Defense: "(1) approve the next phase, (2) order the Air Force to conduct further studies, or (3) discontinue the program" (58:21).

The Demonstration and Validation Phase. In this phase, the alternative systems selected in the concept exploration phase are further defined, and the feasibility of their design approaches are evaluated (1:81; 58:24). The process currently favored to define these systems is to have at least two of the contractors build prototypes of their proposed weapon systems, which can then be compared and evaluated (58:24).

The results of the demonstration and validation phase are evaluated in preparation for Milestone II, known as the Program Go-Ahead Decision (58:24). This decision is made by the Secretary of Defense, based on the results of a second review process by both the Air Force and Defense Systems Acquisition Review Councils (58:24). "The primary

documents used in reaching the decision are the Decision Coordinating Paper and the Integrated Program Summary" (58:25). These documents "summarize the Air Force acquisition plan for the system's life cycle and provide a management overview of the program" (58:25). If the Secretary of Defense approves the proposal, the program will then enter the Full-Scale Development phase (58:25).

The Full-Scale Development Phase. During this phase, the entire system is "designed, developed, fabricated, and tested" (58:26). This effort also includes "all essential support equipment and documentation" (58:26). The final product is intended to be the prototype for future large-scale production (58:26).

At the end of the Full-Scale Development phase comes Milestone III, known as the Production/Deployment decision (58:28). The Secretary of the Air Force has the authority to make this decision, "provided there is no major change to the program approved at Milestone II" (58:28). This decision determines whether the system should be produced for operational use, the initial quantities to be produced, and the plans for future production (58:28).

The Production Phase. During this phase, the entire system is produced for operational use (1:81; 59:29). This production includes not only the weapon

system itself, but also such support elements as training equipment, spares, and facilities (1:81; 58:29). As this phase nears completion, the Secretary of the Air Force determines when the system will be ready for deployment to the using command, and relays this information to the Secretary of Defense (58:29).

The Deployment Phase. Deployment begins when the system is actually delivered to operational units and the using command accepts responsibility for the system (58:29).

Two general comments about the systems acquisition process should be made. First, the timing of this long-term cycle is extremely flexible. Each system has unique aspects which must be dealt with individually, and the systems acquisition process is designed to be responsive to these needs.

Second, the three milestones discussed earlier represent critical points in the life cycle of each project. Decisions made at each milestone do not constitute a "blank check" from the Secretary of Defense to carry the program to completion; instead, they represent an incremental commitment of resources which will be sufficient only to reach the next major milestone (58:30). Thus, it is essential that these milestones be realistically set and achieved, or the program will be in danger of being cancelled.

The Program Manager. The individual who is responsible for meeting these milestones is the Program Manager. Department of Defense policy states that

> The Program Manager shall be responsible for acquiring and fielding . . . a system that meets the approved need and achieves the established cost, schedule, readiness, and affordability objectives. (28:11)

The Program Manager's responsibility is clearly not limited to that of the weapon system alone, because the system also consists of the various logistics support functions. Thus, in the development of a systems acquisition program, "all elements must be considered, developed, and procured so that together they provide an operating capability" (6:29).

To meet this objective, the Program Manager assembles a management team consisting of personnel from all of the functional areas relating to the weapon system and its logistics support elements (6:29). This management team forms the basis of the System Program Office (6:29). Thus, the Program Manager and the System Program Office form the focal point for all the research and development relating to the weapon system itself, as well as the logistics in support of that weapon system.

Integrated Logistics Support

One of the primary mechanisms by which these logistics support requirements are generated is the Integrated Logistics Support program. This program is a reflection of the fact that increasing reliance on sophisticated weapon

systems in combat has made logistics support a critical area of concern (43:22). Logistics must be considered during the design process for the system (43:22). Department of Defense policy states that "operational suitability of deployed weapon systems is an objective of equal importance with operational effectiveness" (28:2).

Before the Integrated Logistics Support (ILS) program was initiated in the mid-1960s, the only meaningful design parameter was operational performance: "Logistics support was provided as an afterthought or after the design was so far along that significant changes could not be made" (43:22). Now, however, because the cost of maintaining these systems in the field has become so great, there has essentially been a reversal in the logistics support philosophy (43:22). With the development of Integrated Logistics Support, "effective logistics support for systems and major equipment was systematically planned, acquired, and managed as an integral part of the acquisition process" (8:1-2).

The Integrated Logistics Support program is made up of several elements. These elements are "the composite of management and analysis actions necessary to assure effective and economical support of the material system, both before and after fielding" (43:23). The elements include maintenance planning, supply support, transportation and handling, personnel and training, technical data programs,

and facilities. However, this study will consider only the facilities element.

Basic Integrated Logistics Support guidance was provided in Department of Defense Directive 5000.39 on 17 January 1980. The primary objective of this directive was to emphasize that "the Program Manager . . . is responsible for the acquisition and management of Integrated Logistics Support" (8:2). However, in most major weapon systems, this responsibility is formally assigned to a Deputy Program Manager for Logistics (6:133). The Deputy Program Manager for Logistics heads the Integrated Logistics Support Office, which is

> responsible to the Program Manager for providing logistics inputs to the acquisition program and for planning and achieving assigned [Integrated Logistics Support] for the program. (5:2-1)

The basic document used to structure the Integrated Logistics Support planning process is the Integrated Logistics Support Plan (43:22). The plan is divided into three basic parts:

1. General. This section provides a general description of the weapon system and identifies all participating support organizations (43:23).

2. Concepts and Strategy. This section lists all the applicable Integrated Logistics Support elements (43:23).

3. Milestone Schedule Charts. These charts lay out the timing of the key events in each of the functional areas of the Concepts and Strategy section (43:23).

Part 3 is perhaps the most important part of the plan. According to AFLC/AFSC Pamphlet 800-34, Acquisition Logistics Management,

> procedures should be set up to make sure the organization responsible for a specific milestone chart notifies the [Deputy Program Manager for Logistics] when it becomes apparent that a milestone won't be met. (5:8-1)

Integrated Logistics Support Facilities Element. According to AFR 800-8, Integrated Logistics Support Program, the requirements for facilities are as follows:

> prepare facility requirements plan; conduct surveys to determine requirements for new or modified, preoperational, operational, training, depot, or simulator facilities; budget for and construct facilities; etc. (28:18)

The Facilities Acquisition Process

The facilities associated with a major new weapon system are a critical aspect of the overall logistics support required before the system can become operational. "An aircraft system may require as many as fifty separate facilities at an operational base" (2:1). These include facilities for operations, maintenance, storage, and field training (2:1). The importance of having the proper facilities ready on time is emphasized in Department of Defense Directive 5000.1, Major Systems Acquisitions, which states:

"minimizing the time it takes to acquire materiel and facilities to satisfy military needs shall be a primary goal in the development of an acquisition strategy" (28:6).

The facilities acquisition process operates on an entirely separate track than the systems acquisition process. It not only provides facilities to support new weapon systems, but also "acts independently to provide support facilities not associated with any particular weapon system" (45:22). However, the facilities acquisition process follows essentially the same pattern for all projects, no matter how the requirements are generated. Because this study is considering the impact of a major system deployment, the majority of required support facilities are assumed to be large enough to require programming through the formal Military Construction Program process. Alternative methods by which facilities can be obtained will be considered later in this literature review.

The facilities acquisition process is strictly controlled by public law, and essentially consists of a series of project reviews. Estimates vary, but on the average, it takes three to five years to complete the entire facilities acquisition cycle (2:4; 3:34; 8:8; 92:8).

Four Phases of Facilities Acquisition Process. This cycle is made up of four phases: 1) the Requirements Identification phase, 2) the Programming phase, 3) the

Design phase, and 4) the Construction phase (2:1; 45:23), as shown in Figure 2.2.

The Requirements Identification Phase. The requirements for facilities associated with a new system generally originate with the weapon system prime contractor (45:23). During the development of the system, the contractor is best able to judge the type of facilities needed, as well as any special requirements within these facilities. The contractor develops a Facilities Requirements Plan, which is then forwarded to the System Program Office (2:3; 45:23). Although the Facilities Requirements Plan may be sent concurrently to the civil engineering organization on the host base which is eventually to receive the weapon system (45:23), in many cases, the actual basing locations have either not been selected or are classified (70).

Once the deployment base has been selected, however, the host base civil engineering organization is responsible for determining "which existing facilities are adequate to support the new mission, which facilities will have to be modified, and what new facilities will have to be built" (45:23).

The Programming Phase. The programming phase begins at the host base civil engineering organization, which prepares an annual Military Construction

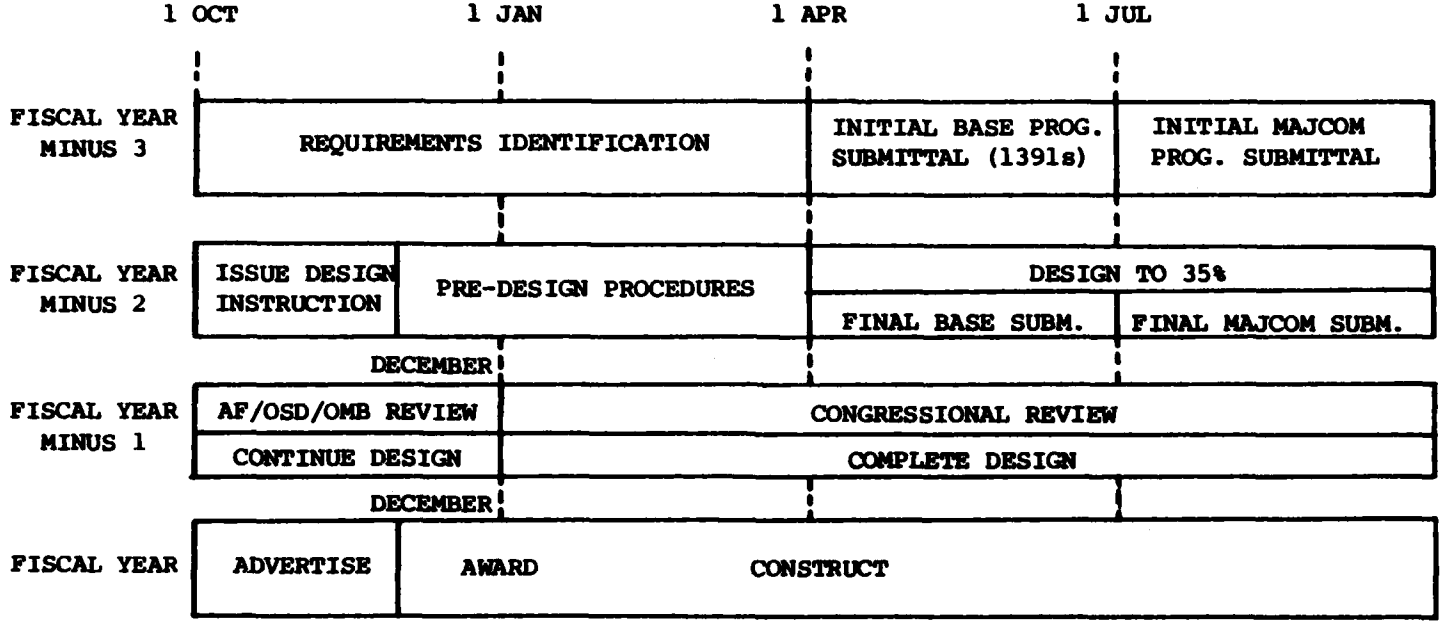


Fig. 2.2. The Facilities Acquisition Process

Program submittal package (45:24; 31:31). The key document in this submission is the DD Form 1391, Military Construction Project Data (31:31). This document includes 1) a description of the proposed construction, 2) construction cost estimates, and 3) a justification of the proposed construction is necessary (2:5).

The Military Construction Program submittal package is forwarded to the base's MAJCOM, which reviews the documents for accuracy and completeness (2:6; 45:24). The projects which are supported at the major command level are then forwarded to the HQ USAF programming division (HQ USAF/LEEP). Here, the submittals from each of the major commands are again reviewed, and the projects to be included in the Air Force's Military Construction Program submission are selected (45:24).

At this point, HQ USAF issues a Design Instruction to the Air Force Regional Civil Engineer (45:24). The Design Instruction lists those projects which have survived the first part of the long review process and have been supported at the HQ USAF level. Receipt of the Design Instruction then allows design work to begin on these projects so that they will be at least 35 percent designed by the time the complete Military Construction Program package is sent to Congress (45:24).

The programming process continues as the Military Construction Program submittals from each of the services

are sent to the Office of the Secretary of Defense (OSD) for review. Following review by OSD, the complete Department of Defense (DOD) Military Construction Program submission is sent to Congress in early January. Congress holds hearings on the submittal, again reviewing the programming documents, and generally selecting the final project list by the following September (45:25). Funding is finally obtained after the President signs the Military Construction Appropriation bill into law (45:25).

The Design Phase. As noted in the previous section, the design phase actually begins when HQ USAF issues the Design Instruction to the MAJCOM or the Air Force Regional Civil Engineer. These agencies begin the design process by selecting a design agent. This agent can either be an in-service organization, such as the Army Corps of Engineers or the Navy Facilities Engineering Command, or a civilian architect-engineer firm (45:25). Because the design effort must be at least 35 percent complete before the project is submitted to Congress (45:26), the design phase operates concurrently with the final stages of the programming phase. The basic objective is

> to have the facility 100 percent designed and construction contract preparation complete[d] when the [Military Construction Program] bill is signed and the funding is apportioned. (45:26)

The final design stages involve a series of project reviews by all affected organizations. These include "the

user, the Major Command, the [Air Force Regional Civil Engineer], the base, and the design agent" (45:26).

The Construction Phase. This phase begins with the preparation of an Invitation For Bids, which is distributed to interested contractors (45:26). "After bids are received and the contract is awarded, a pre-construction conference is held" (45:26) to give the contractor general information concerning such items as site access, security, and material storage (45:26).

The facility is then constructed by the contractor, "under the supervision of the [government's] construction agent" (45:27). The construction agent is the Army Corps of Engineers or the Naval Facilities Engineering Command (2:7). After a final inspection determines that the contractor's work is satisfactory, the Air Force assumes responsibility for the facility from the contractor (45:27). Any additional support equipment which is not part of the basic construction contract can then be installed and checked, making the facility ready for occupancy.

This overview of the facilities acquisition process illustrates the large number of reviews through which a project must pass before being approved and funded by Congress. Further, the key consideration in this review process is timing. The critical submission dates associated with the Military Construction Program cycle stem

directly from the schedule established by the formal Department of Defense Planning, Programming, and Budgeting System, discussed below.

Planning, Programming, and Budgeting System

Up to this point, the literature review has examined both the systems acquisition and facilities acquisition process. To understand how each process fits into the overall DOD resource management system, a brief overview of the Planning, Programming, and Budgeting System (PPBS) will now be presented.

PPBS is a long, complex system which undergoes a large number of reviews. The complexity of the process was perhaps one of the major reasons why PPBS was not adopted in other less-complicated agencies. The formal milestones and reviews can easily overshadow the basic purposes for which PPBS was designed: "To identify mission needs, match them with resource requirements, and translate them into budget proposals" (30:2).

Three Phases of PPBS. PPBS involves three separate management phases: 1) Planning, 2) Programming, and 3) Budgeting (Figure 2.3).

Planning. The planning process "identifies the threat facing the nation during the next five to twenty years, assesses the nation's capability to counter it,

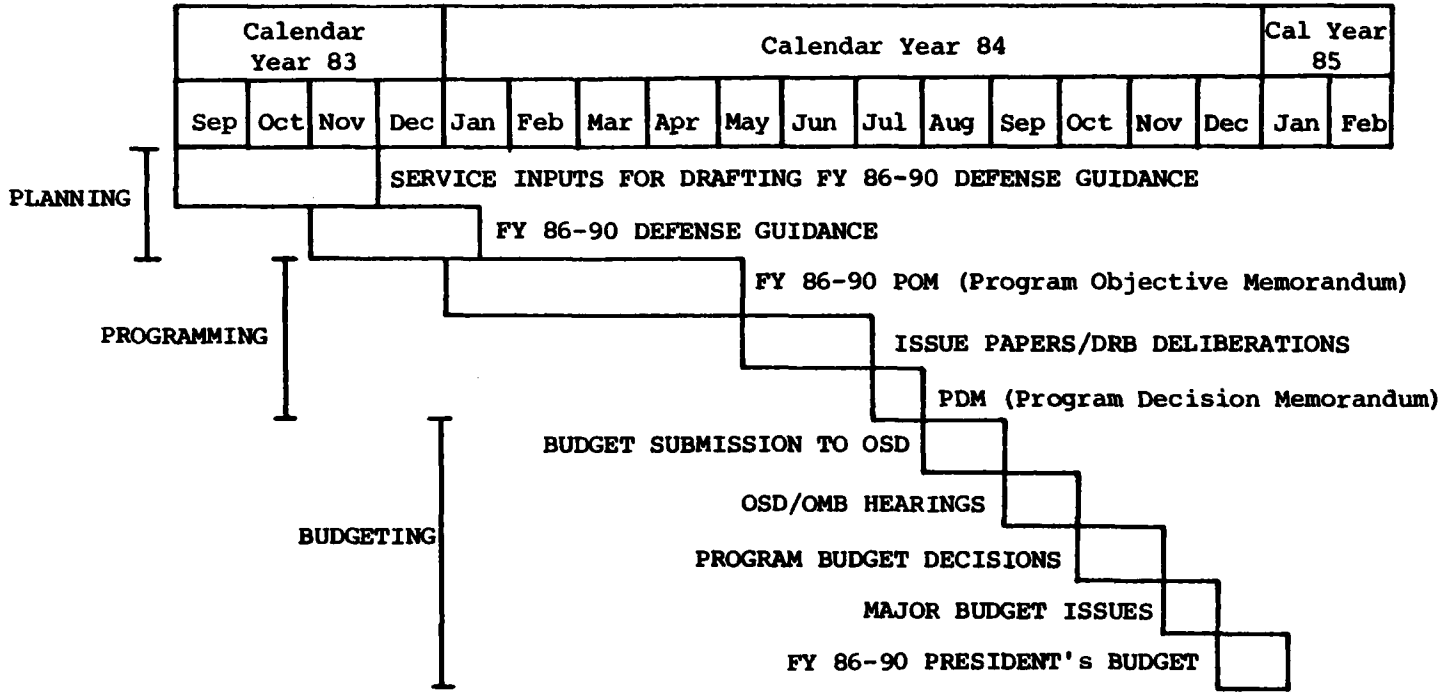


Fig. 2.3. Planning, Programming, and Budgeting (FY 86 Cycle)(58:65)

and recommends the forces necessary to defeat it" (30:8). Resources are not a primary concern in the planning phase; the main emphasis is on how to best deal with the threat (30:8).

Programming. This phase also evaluates the capabilities that the DOD must develop, but now these capabilities are constrained by available resources (30:16). Some of the strategies proposed in the planning stage may, in fact, prove unrealistic when actual costs are considered by DOD programmers. Thus, alternative strategies which are more cost-effective may need to be developed during the programming phase (30:16). Programming essentially serves as the bridge between the fiscally-unconstrained planning phase and the short-term budgeting phase (58:47).

The basis for all DOD programming is the Five Year Defense Plan (FYDP).

> The Five Year Defense Program is the official document which summarizes the [Secretary of Defense] approved programs of the Department of Defense. It is a detailed compilation of the total resources (forces, manpower, procurement, construction, research and development, and dollars) programmed for DOD. (30:5)

The Five Year Defense Plan is updated three times a year. The first time is in January, to reflect the budget submitted to Congress by the President (30:5). In May, the Five Year Defense Plan is updated to reflect each of the armed services' program proposals (30:5). This update represents the first step toward the development of

the next Presidential budget submission (30:5). Finally, the Five Year Defense Plan is updated in September, to reflect the armed services' budget estimates resulting from Secretary of Defense decisions on the service program proposals (30:5).

During the yearly programming cycle, the Air Force uses the products of the planning phase and the inputs from the MAJCOMs to develop its proposed program, known as the Program Objective Memorandum (POM) (30:16). The key feature of the Air Force Program Objective Memorandum development process is the use of a corporate review body--the Air Force Board Structure (30:30), as shown in Figure 2.4.

The lowest level of the Air Force Board Structure is made up of 14 panels, chaired by senior colonels (29:18). These panels are arranged by special mission area, such as the tactical, strategic offense, and strategic defense panels (29:18). The next level of review consists of four committees, chaired by general officers (30:18). The key committee is the Program Review Committee, which receives inputs from the three other committees and develops consolidated recommendations for the entire Air Force program (30:18).

These recommendations are then submitted to the Air Staff Board, which in turn reviews them and submits its recommendations to the final corporate review body, the

*C^3 = Communication, Command, and Control

**RDT & E = Research and Development, Testing and Evaluation

***WRM = War Reserve Materiel

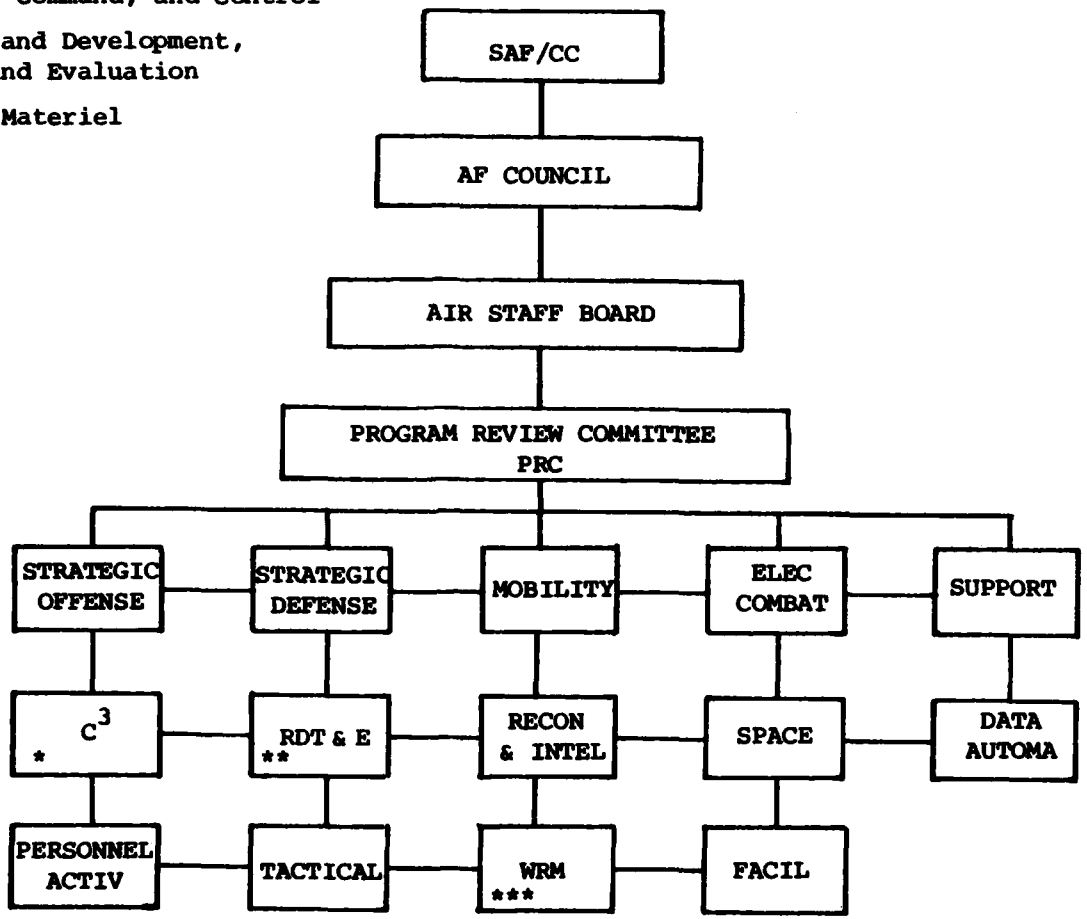


Fig. 2.4. The Air Force Board Structure (30:18)

Air Force Council (30:18). The recommendations made by the Air Force Council go to the Chief of Staff of the Air Force and the Secretary of the Air Force (30:18).

The Program Objective Memorandum, as approved by the Secretary of the Air Force, is then reviewed by the Joint Staff, the OSD staff, and the Office of Management and Budget staff (30:16). The Secretary of Defense's decisions on which portions of each service's Program Objective Memorandum have been approved are provided to each service in a Program Decision Memorandum (PDM) for that service (30:16). "The Program Objective Memorandum, as modified by the Program Decision Memorandum, serves as the start of the budgeting phase" (30:16).

Budgeting. Budgeting is the process by which program decisions are translated into appropriations requests. It is important to note that the DOD considers its resources on the basis of programs, while Congress acts only on appropriations. Consequently, the budgeting process first prepares the Budget Estimate Submission, which is a detailed listing of costs for the Program Objective Memorandum, as modified by the Program Decision Memorandum (30:34). These costs are then translated into funding requirements for Congressional action (30:34). The Budget Estimate Submission undergoes a series of reviews and program budget decisions to ensure that the programs and the dollars are correctly matched (30:35).

In December of each year, the President meets with the Secretary of Defense and the leaders of other federal departments to make final decisions on the budget to be submitted to Congress in January (30:36).

> OSD then submits the DOD budget request for [Office of Management and Budget] final review and incorporation into the President's budget submission to Congress in January. (30:36)

> For the next several months, Congress reviews the DOD budget . . . and must pass both authorization and appropriation legislation before the services have an approved budget to start the new fiscal year on 1 October. (30:36)

This general overview of the PPBS process illustrates the highly structured review process through which programs must pass before being approved. As noted earlier in the chapter, the DSARC process is tailored to individual systems acquisition programs, since the timing of each major weapon system acquisition program can vary significantly. Nevertheless, any changes in the funding of a systems acquisition program must be reflected in the Program Objective Memorandum (89:23). Thus, the PPBS calendar deadlines must be observed by the management of the systems acquisition program so that their funding requests meet important PPBS submission deadlines. However, in general, the PPBS time constraints do not play as great a role in the systems acquisition cycle as do the AFSARC and DSARC program review milestones.

The Military Construction Program, on the other hand, is totally constrained by the PPBS submission schedule. Projects must be submitted to the appropriate organization levels by the prescribed dates, or they will not be considered until the following year. The differences in timing are a significant factor to be considered when examining improvements in the processes by which facilities are programmed for major new weapon systems.

Alternative Methods of Facility Acquisition

The previous sections have discussed the basic methods by which new facilities are obtained. However, two additional avenues are available for facilities acquisition: 1) Operations and Maintenance (O&M) Minor Construction, and 2) Unspecified Minor Construction (P-341).

O&M Minor Construction. According to AFR 86-1, Programming Civil Engineer Resources, "Projects whose funded cost is $200,000 or less can be accomplished with funds available for O&M" (31:62). Minor construction projects are particularly useful for altering existing facilities to make them suitable for new systems.

Minor construction projects are bound by a series of limitations on their proper use. Many of these limitations are linked to the concept of the "complete and usable facility." This phrase implies that a given project will include all activities necessary to become operational, and will not require additional funds or projects to complete the activities (31:62). This concept is contained in the definition of "single undertaking," which

> consists of all the construction work needed to provide a complete and usable facility, or a complete and usable improvement to an existing facility. This term emphasizes that the project will not only produce a complete and usable facility or improvement, but work necessary to attain that end has not been divided into one or more projects for the purpose of staying beneath approval levels or statutory limits. (31:104)

Other Minor Construction limitations include the following:

1. Project Splitting. A project cannot be divided into smaller increments to keep the project within Minor Construction approval levels (31:62).

2. Incrementing. "Programming portions of a building or improvement in successive years' construction programs, each of which produces a complete and useable facility" is not permitted (31:62).

3. Additional Work on a Facility.

> The facility or improvement to a facility resulting from a Military Construction Program or Minor Construction project may not receive an additional Minor Construction project within 12 months of the beneficial occupancy date of the initial Military Construction Program or Minor Construction work without approval of HQ USAF. (31:62)

4. Concurrent Work. "A concurrent Minor Construction project cannot be used to reduce the cost of a Military Construction Program project below cost variation notification levels" (31:62).

In recent years, civil engineering programming regulations have undergone a major revision concerning the use of minor construction funds for the beddown of new missions.

> Facilities associated with a mission beddown need not be aggregated into a single project. Each facility, whether provided as a new building or as an upgrade to an existing building required to support a mission beddown, is a separate project. This is a complete reversal from the practice prevailing from fiscal years 1978-82. (31:61).

Previous programming constraints had all but required that facilities be programmed through the Military Construction Program, since the total amount of construction needed for a mission beddown far exceeded Minor Construction funding limits. This change now allows a much more rapid means for acquiring facilities (roughly a one-year lead time for Minor Construction versus three to five years through Military Construction Program channels).

Use of Minor Construction for Interim Facilities. One situation which may arise with a new mission beddown is the need for interim facilities. An interim facility requirement is defined as

> a short-term, normally 3 years or less, requirement for facilities caused by transitory peak military

> mission or urgent requirement pending approval and construction of facilities by normal Military Construction Program. (31:103)

In such cases, a Military Construction Program project may be preceded by a Minor Construction project "when such unspecified Minor Construction would provide a complete and usable facility to meet a specific need during a specific time period" (31:61). A Minor Construction Project may also follow a Military Construction Program project "when new mission requirements develop within 12 months after the Military Construction Program project has been completed" (31:61). Of course, each of these situations requires the approval of HQ USAF, as well as certain Congressional committees (31:61-62). The regulations are quite emphatic in their admonition that these guidelines be followed: "Violations may result in personal civil liability, criminal prosecution, or disciplinary action against all responsible officials" (31:62).

Unspecified Minor Construction (P-341). P-341 funds are used for urgently needed or time-critical projects. According to AFR 86-1, P-341 funds provide

> a means of accomplishing urgent projects that develop after the annual [Military Construction Program] has been submitted to the Congress, but which cannot wait until the next annual cycle for accomplishment. (31:79)

Air Force programming regulations mention two key factors which must be considered before deciding to request

P-341 funds. First, it must be clear that "the project absolutely cannot wait until the next [Military Construction Program]" (31:79). Second, the base civil engineering organization must make certain that "the project can be awarded several months before dollars are available from the next [Military Construction Program]" (31:79).

A third factor not specifically mentioned in the programming regulations is that only a limited supply of P-341 funds is available, so there is intense competition for P-341 funds among Air Force bases and MAJCOMs. Thus, the justification portion of the DD Form 1391 becomes an even more critical element of the funding request.

The funding range for a P-341 project is from $200,000 to $1 million (31:79). These funds come from "[Military Construction Program] project cancellations and savings" (31:79) identified by HQ USAF. Congress also appropriates military construction funds for Unspecified Minor Construction requirements. Projects requiring more than $1 million will need to be done by means of normal Military Construction Program procedures, because "combining P-341 funds with O&M . . . funds to accomplish a single [Minor Construction] project is prohibited" (31:64).

Previous Recommendations for Improving Systems Acquisition

The Acquisition Improvement Program. When Deputy Secretary of Defense Frank C. Carlucci took office in

January 1981, one of his first actions was to review the acquisition process in search of ways to improve it. He was aware that during the past decade, no less than 12 major studies of the acquisition process had been conducted (16:56-57), and so was convinced that "we did not need another study--the time for action had arrived" (16:56). Therefore, Carlucci's working groups reviewed the solutions that had been proposed in the past, and presented a recommended course of action (16:57).

The working group's efforts resulted in 32 initiatives designed to

> 1) promote decentralization and participative management,
> 2) improve the planning and execution of weapon system programs,
> 3) strengthen the industrial base that supports the DOD,
> 4) increase the readiness of weapon systems, particularly in the early stages of their lives in the field, and
> 5) reduce the burdensome administrative requirements that make the acquisition process more costly and time-consuming than necessary. (16:57)

These 32 initiatives form the core of the DOD's Acquisition Improvement Program, which Secretary of Defense Weinberger has promised will "demonstrate to the American taxpayer that we can and will manage our large, complex, and critically needed defense establishment in a prudent and businesslike manner" (33:9).

Six of the 32 initiatives are of particular interest to this study. They are

Initiative 2: Increase the Use of Preplanned Product Improvement

Initiative 4: Increase Program Stability

Initiative 9: System Support Readiness

Initiative 29: Integrate DSARC and PPBS Processes

Initiative 30: Increase Program Manager Visibility of Support Resources

Initiative 31: Improve Reliability and Support

Each of these six areas will now be considered in more detail, with special emphasis on their impact on the facility acquisition process.

Initiative 2: Increase the Use of Preplanned Product Improvement. Preplanned Product Improvement is a concept

> designed to shorten the time required to field new weapon systems by fielding systems using relatively mature technology and planning for incorporation of advanced technologies after the system is deployed. (64:17)

Before Preplanned Product Improvement was instituted, a weapon system was first identified to counter a given threat, and then, if changes occurred in either the threat or the technology used for the system, the program schedule would be delayed while the system was redesigned (64:18-19). In a rapidly changing environment, attempting to design a "perfect" system could conceivably delay a program indefinitely.

Using Preplanned Product Improvement, the initial design would be fielded as soon as possible using existing technology, with full knowledge that technology upgrades will be done after the system is already in the field.

Initial planning on the system would try to anticipate the Preplanned Product Improvement requirements.

> Provisions will include structure, space, weight, moment, power, air conditioning, and other accommodations to facilitate production incorporation and retrofit and minimize operational and logistic support disruption. (64:25)

Furthermore, the resources to accomplish Preplanned Product Improvement will be identified in the early stages of the program, and "once Preplanned Product Improvement becomes a part of the acquisition strategy, failure to fund it will be considered a major change in program direction" (64: 18-19).

This statement presumably refers to systems funds; it does not make clear how changes in support elements will be treated. This concern is voiced in a number of sources. For example, one author cautions that

> because Preplanned Product Improvement involves development and, ultimately, the fielding of two different components for the same function, additional logistics complexity will be encountered--at least during the transitional period. It is therefore incumbent upon the program manager to evaluate the tradeoffs involving reliability/supportability and the added logistics burden. (17:176)

This is especially relevant for the facility support of the system. AFR 86-1, Programming Civil Engineer

Resources, specifically prohibits additional alteration work on facilities within one year of construction without the permission of HQ USAF. Should the required changes occur after the one-year point, there is also the problem of obtaining the necessary project priority to assure funding. Thus, it is crucial that such considerations be made at the beginning of the systems development. As one source notes,

> the improvement program must not become the unfavored stepchild of the program. It must be an integral part of the program manager's planning and execution; otherwise, its effect on other aspects of the program--logistics supportability in particular--may be overlooked. (51:35)

One fundamental area which must be addressed is how a shortened systems lead time will affect the support facility acquisition process. The Military Construction Program is often unable to provide support facilities in a timely fashion, even with today's relatively long system lead times; shortening the systems acquisition process could further aggravate the situation. If Preplanned Product Improvement becomes a widely-used practice in systems acquisition, the Military Construction Program would presumably need to adjust to the shorter acquisition cycle if adequate facilities are to be made available when needed.

Initiative 4: Increase Program Stability. The acquisition environment today is one of change: changes

in the threat, in technology, in economic and political areas, as well as in military guidance and tactics (84:19). "In the face of all these changes, it is no wonder that program stability . . . is extremely difficult to achieve" (84:19).

Program stability is one of the most difficult initiatives to achieve because it depends on so many factors within the systems acquisition process itself. Even defining program stability or stability is difficult, because nearly every agency has its own view of what constitutes program stability or instability. For example, one agency feels that "program stability is a combination of multi-year procurement and efficient production rates" (20:31). Another agency defines program instability as "disruptive turbulence in the acquisition process that causes the project manager to deviate from his established acquisition strategy" (20:31). In fact, one author who had attempted to locate a standard definition of the terms concluded that "almost any ill that befalls a weapon system acquisition program can ultimately be charged to program instability!" (20:31).

Given the difficulty of defining the terms "program stability/instability," it may be more useful to discuss some of the factors which contribute to the instability of a program. Among the primary causes of program stability listed in the literature are funding, the

government's own management policy, government personnel policy, and the government's political processes.

Funding is perhaps the major cause of program instability (49:41; 84:15). Funding problems occur in a number of areas. For example, the entire defense budget itself is subject to a great deal of instability. This instability can be caused by "the normal political process, by the priority and budgeting processes within DOD, and by unanticipated cost growth" (49:41). One study on budget turbulence found the following major destabilizing factors:

> Wars cause the greatest turbulence, followed by changes in administration. Congressional actions are a significant source of program-specific turbulence, but not as large a contributor to topline budget turbulence. (49:42)

Noting the effects of this budget turbulence, General Robert Marsh, former Commander of Air Force Systems Command, said

> in responding to funding shortfalls, which resulted from cuts in our total obligating authority, we have historically stretched our programs to live within the budget--which has meant reduced quantity buys, longer programs, and increased unit costs. (55:3)

A number of corrective measures have been undertaken to reduce these funding problems. For instance, each of the armed services is required to "place approximately ten programs on a 'stable programs list' and then budget the funds necessary to keep those programs stable" (49:41).

Another important initiative concerns the use of independent cost analysis to provide better up-front cost estimates (84:16). The Director of Program Analysis and Evaluation for the Department of Defense has noted that

> major systems must develop both a program office cost estimate and an independent cost estimate. The service may use either cost estimate for budgeting, but it must justify whichever estimate it uses, especially if it is the lower one. (84:19)

Cost estimating has become a major concern within the Department of Defense. In the words of General Marsh,

> we are going to more thoroughly examine systems cost estimates--whether government or industry--to ensure that they are realistic, comprehensive, and encompass the entire weapon system. We will ensure that no element of performance or support is omitted. (55:4)

One major initiative being used to assure effective cost estimates in all areas of support is "program baselining." Baselining is specifically aimed at reducing two causes of program instability: "unrealistically low initial budgeting, and inability to maintain a realistic budget because of engineering changes" (72:28-29).

> A program baseline is a comprehensive description of a program in terms of technical performance, schedule, supportability requirements, etc., which is agreed upon by the developer, the user, the logisticians, and the testers. The program baseline is then signed at the general-officer level of the four participating organizations. . . . Once established, a program baseline will be difficult to change. (84:15)

This definition highlights another important benefit of baselining: it offers a formal procedure by which logistics

concerns (including facilities) are addressed early in the program.

Programs to be considered for baselining are those that are "high value and high priority to meet the threat and warrant increased management attention" (72:29). In general, a program will be considered for baselining "just prior to full scale development, when risk, schedule, and the end item can be fairly well defined" (72:29-30). An indication of the magnitude of these baselining efforts is the fact that the first 24 Air Force programs identified for baselining represented "61 percent of the Air Force's weapon system investment dollar total" (72:30).

The first major program to be baselined was the B-1B bomber, which was cost-capped at $20.5 billion FY 81 dollars (72:29). This baselining effort was a result of "the President's need to certify program cost to Congress" (72:29). Other baselined programs have included the F-16 fighter and the NATO E-3A AWACS aircraft (72:29). Programs baselined in the FY 85 budget included "the C-5B transport aircraft, the Ground-Launched Cruise Missile, and B-1B strategic bomber, and the Peacekeeper" (87:4).

Among the benefits of baselining are the following:

--Forces early program content definition and agreement among all the parties involved in the program.

--Mitigates against "optimistic" program cost estimates.

--Maintains stability in design. (72:32,34)

Use of baselining on increasing numbers of programs is expected to have a significant positive impact on overall program stability in the Department of Defense (72:34).

Another factor which leads to program instability is the government's own management policy. This includes "a lack of discipline in planning for the out-years," (20:31) and even the Defense Systems Acquisition Review Council process itself, which "has in the past contributed to instability since it was not linked to PPBS and the resource allocation process" (20:32). Finally, there is a perception in some circles that "having program stability results in a loss of flexibility" (82:149). This is particularly true in the upper levels of management, such as the Office of Secretary of Defense, the Office of Management and Budget, and Congress (82:149). Thus, "program stability requires that management relinquish some of its discretionary powers" (82:149).

While flexibility is often considered to be beneficial, it can often be viewed as a "destabilizing element, since the services and, indeed, DOD, may be unwilling to firmly commit resources to stabilize one program at the expense of another" (20:32).

Another perspective on the flexibility issue was raised by Major General M. Roger Peterson, USAF, the Deputy Director of the Defense Logistics Agency. He pointed out that

> While program stability may be attractive from an economic standpoint, it may degrade the technical utility of a system in the face of changing threat; i.e., program stability may lead to technical inflexibility. (84:15)

General Peterson went on to suggest "the use of Preplanned Product Improvement as an economical solution to the stability/flexibility paradox" (84:15). As noted in the previous section, Preplanned Product Improvement has the potential to increase program stability by "minimizing the possibility of disruptive technical problems" (82:159). Also, "a system can be fielded sooner if product improvements not yet fully developed to meet the ultimate capabilities are capable of installation as modules in the future" (82:159). This again reduces the likelihood of costly program stretch-outs.

The government's personnel policies are also a source of program instability. Deputy Secretary of Defense Thayer has noted that "the program manager . . . ranks are still hampered by the military system of job rotation" (20:32). Thayer suggests that "longer tours of duty are imperative" (20:32). The average tenure of program managers, service secretaries, and senior OSD officials is 30 months (20:32). "This contrasts with the average tenure of the U.S. senator who reviews DOD programs--more than 10 years" (20:32).

Some sources have traced the causes of program instability to the political process which major weapon systems must undergo.

> For better or worse, the Congress often makes decisions to kill or to support specific weapon systems. They are becoming more activist in their approach to weapon system development, and their increased role accordingly reduces the ability of the DOD to manage its programs. (20:32)

General Marsh, former Commander of the Air Force Systems Command, noted that

> the acquisition process . . . is troubled in a major way by much too much oversight, micromanagement, and microcontrol at the Congressional, OSD, and service staff levels--at all levels above the "doing level." (99:53)

Yet another source reported that

> while Congress is often portrayed as the "villain" in terms of program stretch-outs, reduced funding, varying annual authorizations, etc., in reality, the services themselves actually initiate most of the program stretch-outs and other forms of instability. (84:15)

While much of the political arena is outside of the DOD's control, many believe it is possible to improve relations with Congress, by doing a better job of

> communicating our acquisition plans to Congressional committees and staffs, [and] "selling" them on our plans well enough in advance of the actual authorization and appropriation hearings. (84:15)

Political relations may also be improved by showing that the DOD is able to adequately manage its own programs. Deputy Under Secretary of Defense William Long noted that there is a need for "the initial discipline to make complete

program cancellations rather than stretch-outs" (20:32). By allowing Congress to stretch out marginally-effective programs, the Department of Defense is essentially ignoring the negative impact that this may have on other, more important programs.

Initiatives 9,, 30, and 31: Reliability and Support. Another area of systems acquisition addressed by the Acquisition Improvement Program is that of reliability and support. In the past, these concepts have often been all but ignored in the design of the weapon system. Much more emphasis was given to such parameters as system performance and production schedule. Now, however, the Department of Defense has begun to realize that

> operational and support costs amount to about 60 percent of the total life-cycle cost for a typical weapon system [and that] decisions made very early in the program define the majority of costs that will be incurred during the remainder of the life of the weapon system. (15:11)

Therefore, current policy concerning reliability and supportability is that

> improved readiness is a primary objective of the acquisition process, of comparable importance to the reduced unit cost or reduced acquisition time. Resources to achieve readiness will receive the same emphasis as those required to achieve schedule or performance objectives. (15:11)

Three of the Acquisition Improvement Program initiatives specifically address issues relating to reliability and supportability. These are Number 9, Improve System

Support and Readiness; Number 30, Increase Program Manager Visibility of Support Resources; and Number 31, Improve Reliability and Support (16:55).

Initiative 30 is designed to make the program manager more aware of "the supportability decisions affecting his program" (15:11). This initiative recognizes that

> because of the nature of the PPBS process, the program manager can sometimes be unaware of logistics decisions that directly impact the support of the system he is developing. (16:71)

The management of support resources is further complicated by two circumstances:

> First, the budget is reviewed by appropriation category, and several appropriation accounts are involved in the fielding of weapon systems: R&D, procurement, military construction, operations and maintenance, and military personnel. Second, there are several weapon-support activities that are controlled by service organizations that are not responsible to the program manager. . . . Consequently, the program manager has neither complete visibility of, nor control over, the decisions and resources that influence the readiness of his system. (17:183)

A trial implementation plan began in 1981 in which the program managers of selected acquisition programs briefed their programs to OSD. These presentations

> included the support schedule and readiness objectives, a summary of the weapon system funding profile, and an analysis of the support requirements as a function of the schedule and the readiness objectives. (17:184)

The data presented by the program managers were then reviewed to correct funding shortfalls, if possible (17:184). While the merits of this system are still being evaluated, indications are that the process will probably

be adopted for most major programs in the future, with data submissions replacing the briefings by program managers (17:184).

More specifically, the implementation plan "provides for reporting the funding on nine logistics elements required to deliver a supported system" (25:33), such as support and test equipment, contractor support, and facilities (25:33).

One major problem with this plan is that among these nine logistics elements, several funding categories are held in pooled or common accounts controlled by functional managers (25:33). In other words, such funds are not assigned to a specific weapon system (25:33).

> This not only prevents the program manager from having some degree of control over the funds, but also prevents the program manager from having visibility into the total support funds available to this program. (25:33)

One author noted that, in the FY 86 Program Objective Memorandum, roughly one-third of the support funds were held in non-system-specific funds (25:33-34). Thus, "up to a third of the dollars the program manager is reporting as meeting his support requirements may not be there at all!" (25:34).

The implications of this statement are substantial. During the Air Force budget exercises, program funds are constantly being rearranged, supplemented, or deleted.

> Whatever the impact of these additions and deletions of the procurement funds to a given weapon system program, it is usually known within a matter of hours by the program management office via the Air Staff program element monitor. . . . [However], this is not the case with common-support funds. (25:34)

While common-support accounts are made up of funding requirements from each of several weapon systems, "once the total amount is determined, all program funds lose their identity" (25:34). In addition, "support accounts have historically been a source of funds to feed procurement accounts (within the same appropriation)" (25:34). While facilities would not generally be involved directly, other elements which could affect facilities would be. For example, inadequate funding of support equipment for a particular weapon system could jeopardize facilities which are programmed to house that support equipment.

In any event,

> when cuts or additions are made in support accounts, they may be spread evenly across programs or they may be spread by priorities. The point is, seldom does the program manager have visibility into this pool of funds handled by logistics functional managers at Air Staff level, and never does he have control. (25:34)

This situation inevitably raises the question, "Should the program manager, then, be held responsible for a supported system if he does not have visibility and control over the initial support funds?" (25:34-35). If the answer to this question is "yes," then certain changes to our present accounting system need to be made (25:35).

For instance, "functional managers . . . must be willing to identify common funds with a weapon system in an auditable way" (25:35), or "the program manager must be given overall control of support funds" (25:35). Another possible solution is to baseline common funds, to "prevent the historical 'stealing' from support accounts" (25:35).

Whichever proposal may be selected, this area is certainly one which needs to be addressed by the systems acquisition and support communities. Otherwise, "responsibility for a supported system without control of the funds is tantamount to responsibility without authority--a good recipe for disaster" (25:35).

Initiatives 9 and 31: Setting Readiness Objectives for Weapon Systems. Under initiatives 9 and 31, the readiness objectives for a new weapon system will be considered on the same level of priority as the "more traditional management priorities of cost, schedule, and performance" (103:6). These initiatives further require that such objectives be set very early in the life of the systems (103:6), and that "adequate funds be provided to assure that reliability and supportability are designed and built into the system" (15:11).

The mechanism by which logistics requirements are generated is the logistics support analysis, which is defined as "the composite of systematic actions taken to

identify, analyze, quantify, and process logistic support requirements" (17:179). The current standard for logistics support analysis is the recently-revised MIL-STD-1388-1 (9:8). This standard

> lays out the timing and type of [logistics support analysis] activity to be conducted throughout the system acquisition process. In essence, it outlines a "game plan" for achieving readiness and support objectives. (9:8)

Effective use of logistics support analysis in the past has been limited for a number of reasons:

> --Low priority and insufficient funding.
>
> --Too much emphasis on logistics support analysis data recording.
>
> --Lack of standardization.
>
> --Lack of specificity about early [logistics support analysis] requirements. (9:8)

Another difficulty is that because logistics support analysis is a multidisciplinary activity, "coordination of these interfaces to prevent duplication and to cover possible disconnects remains a major management challenge" (9:10).

A related supportability problem is that of constantly changing requirements. The former Commander of Air Force Logistics Command, General Mullins, believes that

> for years we have emphasized operational performance and have thereby often driven systems into immature technologies that are difficult to support. We've taken the short-term approach to defining basic requirements, the result being constant system changes. (65:5)

Such changes in the system have a direct impact on facilities requirements definition as well. Because of the relatively long facility acquisition lead time, the Military Construction Program often has difficulty responding to the rapidly-changing research and development program for a new weapon system. Thus, it appears that efforts to more fully define supportability and reliability objectives early in the acquisition cycle will better serve the needs of the facility community as well.

Initiative 29: Integrate DSARC and PPBS Process. It should be evident from the overviews presented earlier in the chapter that

> because of the technical complexity of weapon systems and their priority in the nation's affairs, a highly proceduralized system for acquiring major systems and awarding contracts has evolved. (89:28)

The two primary management review processes, the Defense Systems Acquisition Review Council (DSARC) and the Planning, Programming, and Budgeting System (PPBS), have already been covered in some detail. Briefly, the DSARC is the review process by which new weapon systems are evaluated to determine their readiness to proceed with further development. The timing of the DSARC process is flexible, designed to adapt to the changing needs of each weapon system.

In contrast, the PPBS is a fairly rigid annual system of scheduled reviews. "Each service is required to recommend its own program objectives . . . [which are]

filed in a program objective memorandum . . . and included in the five-year defense plan" (89:23).

These two defense policies form the basis for the Office of Management and Budget Circular Number A-109, "Major System Acquisitions," (35) published in April 1976. This document provides general policy guidance for all sectors of the federal government in the acquisition of major new systems (35).

Circular A-109 emphasizes cost control throughout its discussions of program management. This emphasis on cost control means that programs must be continually re-evaluated throughout their acquisition cycles to ensure they remain consistent with initial program objectives (89:23). "The problem with doing this lies in the timing of decisions. The PPBS, [Program Objective Memorandum], and DSARC processes have to be synchronized" (89:23). While the DSARC process is tailored to individual system acquisition programs,

> any DSARC decision involving funding changes has to be reflected in the [Program Objective Memorandum] and submitted to Congress. . . . [Thus,] serious consequences can arise if DOD's funding requests are not in phase with the PPBS. (89:23)

One source noted that

> the problem is that the PPBS has an annual cycle with rigid decision points, whereas the DSARC process is tied to the technical process on individual programs. It is obvious, therefore, that the two will not be in phase. The PPBS is already a drawn-out fiscal approval process, and any lack of coordination with the DSARC process can only exacerbate the funding delay. (89:23)

For example, if approval of a program's Justification for Major System New Start occurs simultaneously with submission of the PPBS Program Objective Memorandum, "the earliest date that funds can be available to start the program is 14 months later. If the Program Objective Memorandum is missed, the delay for funding could be 24 months" (89:23). In essence, then, "the [Program Objective Memorandum] provides the money without authority, while the DSARC decision gives the authority but not the money" (89:23).

One author who performed an extensive review of the literature relating to Circular A-109 found that

> there is unanimity among the writers on program funding. They stress the need for synchronization between the PPBS, which deals with the money-allocation function, and the expenditure function, which is monitored and guided by the review process. (89:23)

The Department of Defense has taken a number of steps to coordinate the PPBS and DSARC processes. For example, it has directed that

> each official who has direct or indirect responsibility for the acquisition process . . . make every effort to correlate individual program decisions with the Planning, Programming, and Budgeting system. (89:23)

Also, the Deputy Secretary of Defense has "proposed regular meetings of the Defense Resources Board to assure that major acquisition systems are more closely aligned to the PPBS" (89:23). The Defense Resources Board is the Secretary of Defense's corporate review body, which "helps him manage two of the major activities in the Pentagon--the PPBS and

the Systems Acquisition process" (29:4). Because "the principal members of the Defense Resources Board serve on the DSARC" (89:23), this initiative should also enable closer coordination between the two processes.

The mechanics of the DSARC process have also been modified to provide a closer link with PPBS. For example, "the [Justification for Major System New Start] is now submitted with the service [Program Objective Memorandum] package that provides funds for its execution" (15:7). Also, the "program go-ahead" milestone is "no longer rigidly tied to the beginning of full-scale development" (15:7). Allowing program managers to delay this milestone means the DSARC can receive

> a more accurate view of cost, schedule, performance, . . . supportability, and testing prior to a decision to commit to the completion of full-scale development, production, and deployment. (15:7)

These changes also have significant implications for the facilities acquisition process. The fact that the Military Construction process is so closely linked to the PPBS can cause problems for systems military construction. For example, if a facility requirement to support a new weapon system arises just after the Program Objective Memorandum submission, it may need to be deferred until the following year. Such a delay can sometimes mean an additional year of using temporary facilities to support the mission while awaiting completion of the Military Construction project originally requested.

Two-Year Federal Budget. Another proposed change which would affect the acquisition processes would be the introduction of a two-year federal budget. As noted earlier, the federal budget of the United States now undergoes an annual cycle of planning, appropriating, and budgeting (61:2). This annual system worked reasonably well for the first 150 years of our nation's existence (61:1); however, "after the expansion of domestic and international financial commitments in the 1930s and 1940s, the growth of the budget has been phenomenal" (61:1). Today, the "annual increases in budget size exceed the total amount of money spent by the federal government in its first one hundred years of operation" (61:1). The result of these increases in the size of federal budgets is that "the activity required to pass recent federal budgets . . . makes passage in a single year impossible" (61:2).

Congress has tried to remedy its inability to pass budget bills on time by using continuing resolutions.

> A continuing resolution is legislation enacted by Congress (when action on appropriations is not completed by the beginning of the fiscal year) that provides interim spending authority for federal agencies or specific activities until regular appropriations are enacted. (61:2)

Congress has been forced to use continuing resolutions more than 15 times since 1977 (61:2). More specifically, from 1977 to 1983, five of the seven defense appropriations bills

were as much as three months late in being enacted (61:13). For military construction in that same period, four of the seven appropriations bills were late (61:13).

The dangers of using these continuing resolutions became evident in 1982, when "disagreement over deficit projections upset an accord on a pending continuing resolution and caused the federal government to go bankrupt for one day" (61:2). This situation prompted Senator Wendall Ford of Delaware to comment,

> The time has come to face up to the realities that in our complex modern society, Government economic planning, budgeting, and appropriating cannot be done constructively in a 12-month period. (61:3)

One of the more prevalent proposals made to reduce these problems is the introduction of a two-year budget process in place of the current one-year process. Proponents of this proposal cite a number of advantages to having a biennial budget. First, "a two-year budget process would enable Congress to spend more time evaluating the worthiness of programs to be funded" (61:4). However, critics of the two-year budget argue that

> additional time to debate issues will only result in more debate. Congress' ability to delay will expand to fill available time, . . . so that budget deadlines will be missed as before, except that they would then be missed every two years rather than every year. (61:5)

A second advantage cited by proponents of the two-year cycle concerns projects such as

> development of major defense systems [which] necessitate multiyear funding, a biennial commitment of funds would reduce uncertainty by enabling planners to make longer range, more efficient plans with less fear of disruption. (61:4)

The counter-argument made to this assertion is that

> more efficient programming will not result from a biennial system because forecasting will be made on a two-year basis. Rapid major changes in the economy could quickly make such forecasts obsolete . . . , with the budget then being poorly matched to economic conditions. (61:6)

Finally, those favoring a two-year budget point out that "a biennial budget would . . . reduce the number of times Congress must act on the same programs. Thus, Congress could devote more time to non-budget legislation" (61:5). Again, critics claim that

> a biennial system . . . would only provide more time for Congress to continue its paralysis over contentious issues, and result in many more hours being spent on budget matters. (61:5)

Despite the continuing debate over the merits of a biennial budget process, there are a number of proposals currently before Congress which call for a biennial budget (61:7). In addition, on 26 April 1985, Secretary of Defense Caspar Weinberger announced that the Department of Defense would be moving to a two-year planning and budgeting cycle beginning with the FY 88 budget (98:36). The DOD submission to Congress will still be made on an annual basis, however (98:36).

The continued delays in the enactment of military construction legislation have a decidedly detrimental

impact on the military construction process, because construction contracts cannot be awarded until Congress enacts these appropriations bills. Thus, a two-year budget cycle could have a significant impact on both the systems and facilities acquisition processes.

III. Methodology

Chapter Overview

This chapter describes the procedures used to accomplish the research objectives and to answer the research questions presented in Chapter I. The chapter also describes the population from which data were collected, the method of data collection, and the procedures used to analyze the data.

Selection of the Research Population

For fields as complex as systems acquisition and facilities acquisition, it was impractical to develop a list of all possible problem areas and solutions beforehand, to be administered in a standard survey form to several hundred respondents. Instead, it was more appropriate to collect the perceptions of a smaller group of well-qualified individuals in more depth. This technique also provided a more diverse and authoritative sample of perceived problem areas and proposed solutions.

The research population was developed by identifying key individuals associated with both facilities and systems acquisition at three organizational levels: OSD/HQ USAF, Major Air Commands (MAJCOMs), and at the base level. In addition, where appropriate, individuals

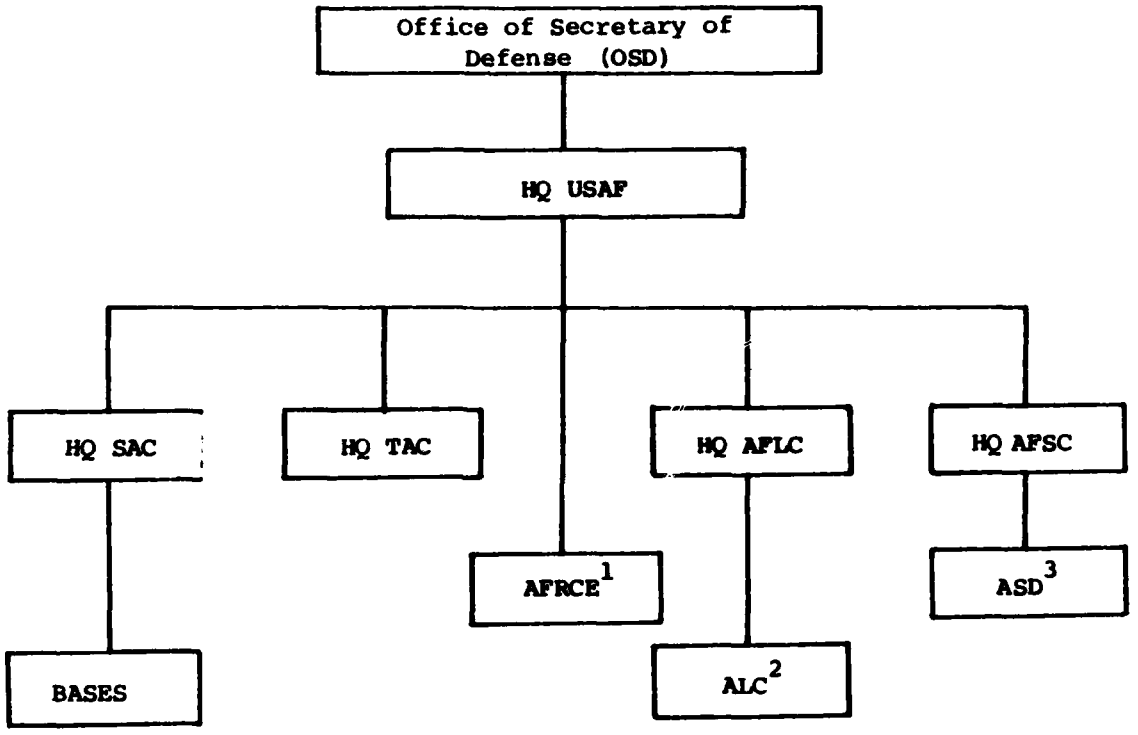
were also identified at intermediate organizational levels, such as the Air Force Regional Civil Engineering organization at Norton AFB and the Aeronautical Systems Division at Wright-Patterson AFB (see Figure 3.1).

Time constraints required that the population be kept relatively small (see Appendix A). The population was not intended to be a comprehensive list of all possible respondents, but rather a representative sample of authorities in the fields of facilities and systems acquisition.

Primary Areas of Concern

The data collection effort concentrated on four primary areas: 1) the B-1B Bomber, 2) the Peacekeeper Missile, 3) Simulators, and 4) Policy and Programs. By covering four broad categories of systems, an attempt was made to gather data that would be readily applicable to other major weapon systems as well. A discussion of the B-1B bomber, the Peacekeeper missile, and the simulator program is presented in Appendix D.

The B-1B and Peacekeeper programs were selected because both these major strategic programs were either under development or, as in the case of the B-1B, had recently been deployed operationally. Thus, there were a number of large organizational structures in existence, providing a ready source of timely data.



[1]Air Force Regional Civil Engineer

[2]Air Logistics Center

[3]Aeronautical Systems Division

Fig. 3.1. Relationship of Organizational Levels Considered in the Study

In contrast, tactical weapon systems were excluded from the study because many of these systems were fielded in the 1970s. While new versions of these aircraft continue to be developed, much of the "corporate memory" relating to their initial development and deployment has been lost, as many of the key people have moved on to other systems. Of course, a number of individuals interviewed in connection with strategic programs had worked with the deployment of tactical systems in the past and provided comments on their experiences. In addition, one interview was conducted with the Deputy Program Manager for Logistics for the Advanced Tactical Fighter, which is scheduled to be deployed in the 1990s.

Simulator programs were selected because simulators are used in nearly all the major weapon systems in several different MAJCOMs. Thus, problems with simulators are not restricted to only tactical or strategic systems, but instead provide a means of comparing problem areas associated with several types of weapon systems.

An overview of Air Force policies was provided by the fourth major division, Policies and Programs. Included in this area were those high-level Air Force policy-makers not specifically associated with a particular weapon system. Many civil engineering personnel were also included in this area, because they are often required to program facilities for a number of different weapon systems.

Method of Data Collection

The personal interview technique was selected as the principal method of data collection to increase the depth and detail of the information collected. This method allowed the interviewer to probe with additional questions when appropriate, to obtain more detailed information in critical areas. Personal interviews also provided an opportunity to examine special materials made available by the interviewee, such as program records, special initiatives, or policy letters.

Development of Interview Questions

A set of 35 standard interview questions was developed to be administered to the survey population (see Appendix B). The questions first gathered demographic data on the interviewees, such as their previous experience in the field, the types of systems with which they had worked, the length of time spent in their present positions, and their duties and responsibilities in those positions. The remainder of the questions were oriented toward answering the following questions:

1. What are the major problem areas relating to facilities acquisition to support major new weapon systems?

2. How does the timing of the systems acquisition process affect the facilities acquisition process?

3. What temporary solutions to these problems have been tried or proposed?

4. What role do political influences play in the facilities acquisition process?

5. What near-term and long-term solutions could be offered to correct these problems?

An abbreviated interview form consisting of four questions taken from the full 35-question format was also developed (see Appendix C). This abbreviated form was used for key personnel who visited Wright-Patterson AFB and had limited interview time available during their visits.

Data Collection

Data was collected through a series of 51 structured personal interviews. Preliminary interviews were done between October 1984 and February 1985, while the majority of interviews were conducted in a two-month period between April and June 1985. Nearly 36 hours were spent interviewing these 51 individuals. The average interview lasted 45 minutes, with actual interview times ranging from 20 minutes to three hours.

Of the 51 interviews, 28 were conducted in person, and 23 were conducted by telephone. The telephone interviews provided an efficient way to reach individuals in such locations as Washington, D.C.; Texas; Wyoming; and California. They also eliminated the substantial

investments in time and TDY funds that would have resulted from trips to these locations.

The respondents were provided with copies of the interview questions in advance for their use during the interview. The interviews were tape-recorded with the interviewees' consent to aid in later data transcription. The interview tapes were then transcribed onto 20-page data forms, which assisted in the initial categorization of responses. These interview transcriptions resulted in approximately 975 pages of data.

Several individuals elected to speak off the record in certain areas; others simply asked that their names not be used in connection with certain sensitive comments. All such requests were, of course, honored in the writing of this report. Throughout the thesis, care was taken to reflect the respondents' unanimous intention--to improve the acquisition process rather than merely to criticize it.

Data Analysis

Data collected from these 51 interviews was analyzed and grouped into the following categories of problems and solutions.

1. Problem Areas
    a. Basing/Deployment
    b. Communication/Coordination

c. Corps of Engineers/Construction

d. Funding

e. Political and Legislative Issues

f. PPBS/Programming Documents

g. Requirements Identification

h. Support Equipment

i. Timing

2. Solutions

a. Communication/Coordination

b. Education

c. Organizational/Procedural Changes

d. Temporary Solutions

e. Special Initiatives

The data forms were then color-coded to identify these categories of information in each form.

Finally, data forms were arranged by organizational level (i.e., HQ USAF, MAJCOM, etc.). Responses from each problem area and proposed solutions were then grouped for each of the organizational levels in an effort to identify common trends in perceptions between levels and systems.

IV. Presentation of Results

Chapter Overview

This chapter presents a description of the data collected by means of personal interviews. The data is presented in four sections: 1) Demographic Data, 2) Major Problem Areas, 3) Interim Solutions, 4) Proposed Corrective Actions.

Demographic Data

The demographic breakdown of the interviewees is shown in Table 4.1. A complete listing of the interviewees is presented in Appendix A.

Major Problem Areas

Question 11 of the interview asked respondents to identify the single most important problem associated with facility acquisition for weapon systems. The problem areas and their frequency of mention are shown in Table 4.2.

Later interview questions solicited the interviewees' responses to particular subjects, such as political and timing concerns. When solicited, the overall frequencies of response were as shown in Table 4.3. These responses are further broken out by organizational level and by weapon system in Tables 4.4 and 4.5, respectively.

TABLE 4.1

DEMOGRAPHICS OF INTERVIEWEES

Level	Policy & Progams	Peace-keeper	B-1B	Flight Sims	Ftr Acft	Total
HQ USAF (OSD)	8	1	2	0	0	11 (22%)
MAJCOM	7	2	3	1	1	14 (27%)
ASD	3	1	4	4	2	14 (27%)
AFRCE	0	5	0	0	0	5 (10%)
BASE	0	4	3	0	0	7 (14%)
TOTAL	18 (35%)	13 (25%)	12 (24%)	5 (10%)	3 (6%)	51 (100%)

TABLE 4.2

FREQUENCY OF MENTION FOR PRIMARY PROBLEM AREAS
(INTERVIEW QUESTION NUMBER 11)

Requirements Identification	25
Timing	11
Funding	8
Communication/Coordination	3
Political	2
No Response	2

TABLE 4.3

PROBLEM AREAS BY FREQUENCY OF MENTION
THROUGHOUT THE INTERVIEW

Requirements Identification	45
Timing	34
Political	30
Funding	24
Communication/Coordination	14

TABLE 4.4

FREQUENCY OF MENTION FOR PROBLEM AREAS, BY ORGANIZATIONAL LEVEL

Organizational Level	Requirements Identification	Timing	Funding	Comm/ Coord	Political	Number of Respondents
HQ USAF/ OSD	10	6	7	2	5	11
MAJCOM	13	12	8	1	9	14
ASD	12	11	5	4	8	14
AFRCE/ALC	5	2	4	2	5	5
BASE	5	3	0	5	3	7
TOTALS	45	34	24	14	30	51

TABLE 4.5

FREQUENCY OF MENTION FOR PROBLEM AREAS, BY SYSTEM

System	Requirements Identification	Timing	Funding	Comm/ Coord	Political	Number of Respondents
B-B Bomber	11	8	6	6	10	12
Fighter Aircraft	1	2	1	0	2	3
Peacekeeper Missile	12	8	7	7	8	13
Policy and Programs	17	12	9	1	8	18
Simulators	4	4	1	0	1	5
Totals	45	34	24	14	30	51

The problem areas presented in these three tables were mentioned by some or all of the respondents at some point during the interview. However, because interviewees were not asked to rank order a list of problem areas, the data does not necessarily reflect the relative emphasis placed on the problems by the respondents. A discussion of the varying degrees of emphasis among organizational levels and weapon systems will be presented in Chapter V.

To further evaluate the nature of problems associated with system facilities acquisition, respondents were asked 1) whether there are problems common to several weapon systems (question 9) and 2) whether some systems are more prone to facility acquisition problems than others (question 10). The responses to these questions are shown in Tables 4.6 and 4.7, respectively.

TABLE 4.6

PROBLEMS COMMON TO SEVERAL WEAPON SYSTEMS
(INTERVIEW QUESTION NUMBER 9)

Requirements Identification	15
Timing	7
Funding	5
Politics	3
All Systems are Unique	3
Basing	2
Lack of Education or Continuity	2
Other	3

TABLE 4.7

CHARACTERISTICS OF SYSTEMS WHICH ARE MORE PRONE TO FACILITY PROBLEMS (INTERVIEW QUESTION NUMBER 10)

Complex ("Leading edge technology") systems	11
Politically controversial systems	7
Accelerated Timing ("Fast Track") Systems	6
Larger (size) systems	2
Smaller (less than major) systems	2
Basing	2
Systems requiring more system/facility integration (such as missiles and simulators)	2
Other	2

Interim Measures

During the interviews, individuals were asked whether they were familiar with any methods which had been used with some success to either avoid problems or to provide temporary facilities until permanent facilities were available. Their responses provided a wide range of available options, as shown in Table 4.8.

Corrective Actions

For the last two questions of the interview, the respondents were asked to provide initial, short-term solusions to the problems mentioned during the interview, as

TABLE 4.8

INTERIM MEASURES (INTERVIEW QUESTION NUMBER 13)

Used Existing Facilities	22
Used Operations and Maintenance Funds	13
Rented Trailers	13
Used P-341 Funds	9
Used Interim Contractor Support	8
Constructed Interim Storage Facilities	7
Established Site Activation Task Forces and Other Working Groups	6
Rented Space Off Base	5
Sent People or Equipment to Contractors' Facilities	5
Sent People or Equipment to Other Bases	4
Contractor Stored Equipment at Government Expense	3
Other	8

well as recommended long-term corrective actions. Table 4.9 presents the short-term corrective actions and their frequency of mention. Table 4.10 presents the solutions which were listed as being most important (question 35) and the number of people who mentioned each particular solution.

The following chapter presents a more detailed discussion of the research results.

TABLE 4.9

PROPOSED SHORT-TERM SOLUTIONS, BY FREQUENCY OF MENTION (INTERVIEW QUESTION NUMBER 34)

Improve accuracy of programming document cost estimates	4
Use more O&M funds for system beddowns	3
Let the people at the working level make decisions and reduce "micromanagement"	2
Minimize personnel turnover	2
Use facility boards to evaluate facility engineering change proposals	2
Establish a Corps of Engineers Special Projects Group for multiple beddowns of a weapon system	2
Use Integrated Logistics Support more effectively	2
Establish a permanent Scowcroft Commission to better integrate military and political concerns	2

TABLE 4.10

PROPOSED LONG-TERM SOLUTIONS, BY FREQUENCY OF MENTION (INTERVIEW QUESTION NUMBER 35)

Educate systems and facilities acquisition personnel, and members of Congress	15
Implement legislative changes to more closely link the facilities and systems acquisition processes	9
Require better definition of requirements earlier in the systems acquisition cycle	7
Set aside military construction funds specifically for system beddowns	7
Utilize Site Activation Task Forces and other working groups as much as possible	5
Put the Program Manager in charge of military construction funds for his system	5
Address support facilities with the same emphasis as the weapon system itself	4
Establish an Acquisition Civil Engineering branch	4
Combine military construction funds with systems acquisition funds	3
Establish a two-year federal budget cycle	3
Let the Air Force be its own construction agent	2
Establish closer coordination between the systems and facilities acquisition communities	2
Baseline facility requirements	2

V. Analysis and Discussion of Results

Chapter Overview

This chapter presents a discussion of the information obtained during interviews with members of the systems acquisition and facilities acquisition communities. The chapter is divided into five sections, with one section devoted to each of the five most frequently mentioned problem areas in response to interview question 11: What is the single most important problem associated with facilities acquisition for new weapon systems? As reported in Chapter IV, these problem areas are: 1) Requirements Identification, 2) Timing, 3) Funding, 4) Communication and Coordination, and 5) Political concerns. Within these sections, the material is further divided into 1) discussions of trends by organizational level and by system, 2) specific problem areas, and 3) solutions proposed during the interviews.

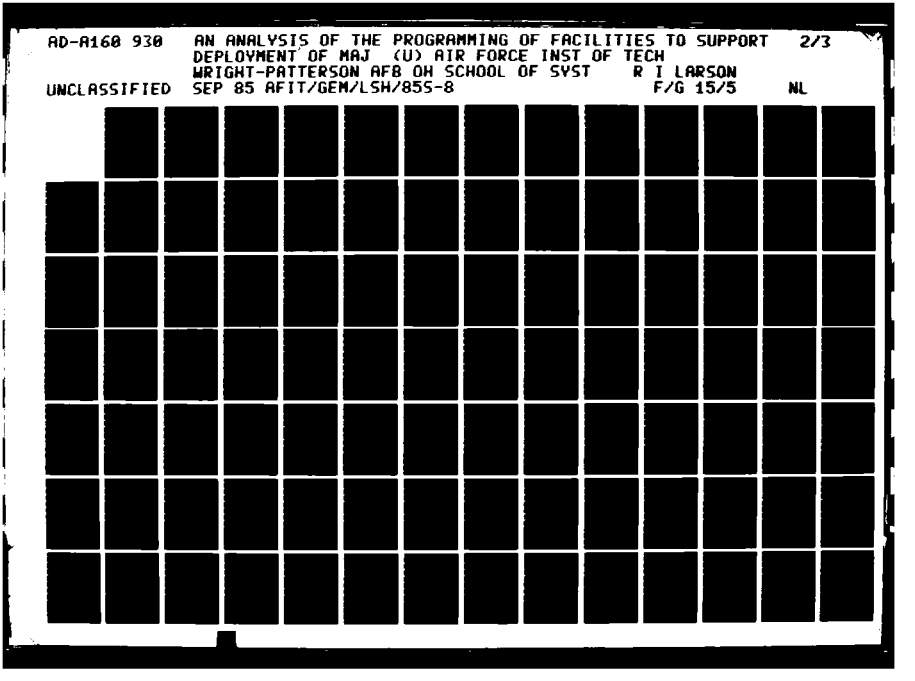
Requirements Identification

Based on the responses to question 11, the problem of obtaining timely identification of facility requirements was clearly the one of highest priority to the 51 individuals interviewed. Requirements identification was mentioned by 25 out of the 51 respondents as being the

most important problem area. Overall, requirements identification was mentioned by 45 of the 51 respondents.

Analysis by Level. Requirements identification was consistently mentioned as being the most important problem at all five organizational levels (HQ USAF/OSD, MAJCOM, Aeronautical Systems Division, AFRCE/Air Logistics Center, and base level). However, there were some differences evident in the factors perceived as contributing to these requirements problems.

Base Level. At the base level, communication and coordination appeared to be the most frequently mentioned contributing factors. Individuals at the base level consistently commented on the need to get the user involved early in the requirements identification phase, to reduce the number of changes needed during construction. They also expressed concern at the apparent lack of a formal communication system by which requirements were transmitted to the base from the systems contractor and from higher headquarters. Individuals at the base generally felt that although they were the ones who would ultimately be responsible for the operation of the system and the support facilities, they were frequently isolated from the decision-making process.


AD-A160 930 AN ANALYSIS OF THE PROGRAMMING OF FACILITIES TO SUPPORT 2/3
DEPLOYMENT OF MAJ (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF SYST R I LARSON
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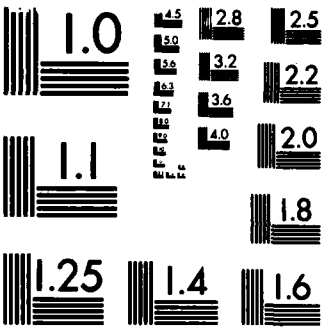


AFRCE/Air Logistics Center Level. The individuals at the AFRCE/Air Logistics Center level had a somewhat different perspective on the requirements identification problem. They mentioned political issues just as frequently as requirements issues. More specifically, they generally viewed the Congressional delays in funding and requirements as being the primary contributing factors to requirements identification problems. Another significant factor mentioned by these five individuals was the timing problem associated with the differences between the systems acquisition cycle and the Military Construction Program cycle. It should also be noted that all five individuals interviewed at this level were associated with the Peacekeeper program, and their responses are consistent with the perceptions of individuals at other levels in the Peacekeeper program.

Aeronautical Systems Division Level. At the Aeronautical Systems Division level, timing factors were most frequently mentioned as contributing to requirements identification problems. In particular, problems with the timely identification of support equipment criteria were cited as causing problems for facility development. This was an especially critical problem with the B-1B program, in which facilities were being developed concurrently with support equipment. Neither political nor

communication/coordination programs received significant mention at this level.

MAJCOM Level. Individuals at the MAJCOM level generally felt that timing issues represented the most significant factor in requirements identification programs. Development of support equipment and the associated maintenance concept were cited frequently by these individuals as causing delays in requirements identification. Along with timing, obtaining adequate funding from Congress was also a frequently mentioned factor in requirements identification.

HQ USAF/OSD Level. At the HQ USAF/OSD level, funding appeared to be the most commonly mentioned reason for needing more accurate identification of requirements. Individuals often commented on the need to have valid requirements, along with accurate cost estimates, before going to Congress with a funding request. They also recognized that maintenance facilities presented greater requirements identification problems, because of late notification of support equipment criteria. Thus, support equipment was singled out at nearly every level as being an especially troublesome problem. Finally, members of the Air Staff felt that the differences in systems acquisition and Military Construction Program timing also caused some problems for requirements identification. However,

they generally felt that the Planning, Programming, and Budgeting System was flexible enough to handle any requirements changes resulting from these differences in timing.

Analysis by System. When the results are examined by system, rather than by organizational level, other factors become evident. Requirements identification remained the most frequently mentioned problem area. However, political concerns were often mentioned more prominently as a contributing factor to requirements identification problems in the Peacekeeper, the B-1B, and the tactical fighter programs.

Within the Peacekeeper program, requirements identification problems were directly linked to the numerous basing mode changes and facility funding delays imposed by Congress. In the B-1B program, political concerns were also expressed; however, it is significant to note that several individuals in the B-1B program felt that political influence was helpful to the program as a whole, allowing them to receive adequate funding for facilities.

Only three individuals were interviewed from fighter aircraft programs, so it is difficult to draw conclusions from such a limited sample. However, these three individuals generally agreed that tactical systems experience more problems due to basing changes than do strategic systems.

Specific Requirements Identification Problem Areas. From the discussion of trends by organizational level, it is evident that problems with requirements identification can be traced to any of the four other problem areas. However, each of these concerns will be covered in more detail in the following sections of the chapter. Therefore, this section will focus only on those problem areas related specifically to the identification of requirements. For purposes of discussion, the factors cited as affecting the identification of facility requirements can generally be divided into two categories: 1) Requirements Issues Within the Facilities Acquisition Community, and 2) Relations Between the Facilities Acquisition and the Systems Acquisition Communities.

Requirements Issues Within the Facilities Acquisition Community. One of the major problems noted in the literature review was the overall decentralization of the facility acquisition process. There appeared to be no central agency responsible for the identification of requirements. This decentralized facility acquisition process stands in marked contrast to that of the weapon system itself, where the Program Manager is given primary responsibility for all aspects of system development.

The results of the interviews provided additional evidence for this observation. For example, the

information provided in the manufacturer's Facility Requirements Plan is often quite general in nature, providing little in the way of specific requirements, such as facility sizes and power requirements (18; 46; 70).

There also appeared to be some concern over the handling of the Facility Requirements Plan. Because the manufacturer's Facility Requirements Plan gives only general facility requirements, a base survey team must be used to tailor the plan to the base at which the system will be located (95).

Base survey teams generally consist of members from the System Program Office, the weapon system manufacturer, the MAJCOM for the base being surveyed, and base civil engineering personnel (7). However, the involvement of base civil engineering personnel varies. One individual felt that the surveys could be more beneficial if the members of the base civil engineering organization would be allowed to take a more active role in the base survey for a new weapon system (47). In other instances, however, involvement of base personnel is limited by necessity, because the basing decision is classified "Secret" until after the programming documents are submitted to Congress (70). An example of this was the base survey done at Wurtsmith AFB, Michigan, for the B-1B bomber. Because the B-1B basing plan was still classified "Secret," members of the Aeronautical Systems Division B-1B System Program

Office worked with a very limited number of Wurtsmith base civil engineering personnel (90; 94). It should be noted, however, that after the survey was completed, the decision was made not to base the bomber at Wurtsmith AFB, so no further work was done at the base to prepare for the system (90).

The general requirements identification procedure is that the base survey team makes a report of its findings, providing a list of recommended facility requirements. This report is then made available to the base civil engineering organization, which uses the requirements recommendations to develop the required programming documents. One problem associated with this procedure is that the base personnel sometimes feel they need more new facilities than the base survey recommends (63). While the survey team may have felt a given existing facility was adequate, or could be made adequate with minor modifications, the base personnel may feel that a new facility is required (26; 44; 63). The decision over whether to build a new facility for the new mission or to make do with an existing facility is a difficult one. The problem is commonly referred to as a "get well" situation or, in somewhat more derogatory tones, "gold plating." Both terms imply that the base is merely using the introduction of a new weapon system as an excuse for new facilities which it may not have been previously able to justify (44; 50; 63).

A legitimate case can also be made for the opposing view, however, that the base really does need new facilities to house the weapon system and all the various support elements associated with it. The Air Force Civil Engineering community is currently engaged in a concentrated facility modernization program, designed to improve the living and working conditions for Air Force personnel. One individual, speaking off the record, felt that many so-called "get well" projects associated with a major new weapon system could be justified as part of this modernization program.

Another issue within the facility requirements problem area concerns the preparation of programming documents. These documents, especially the DD Form 1391, serve as the basis for the review and approval of a project at each successive level of command, up through Congress. As such, it is essential that they be as complete and accurate as possible.

During the interview process, a number of individuals cited problems with the preparation of the programming documents. One individual at the base level commented that the programming section was often forced to submit so many 1391s (and resubmit them in successive years if they were disapproved initially) that the requirements shown in the 1391 sometimes did not reflect the actual project needs (11). Unfortunately, once approved, the requirements shown

on the 1391 cannot be easily changed. The base may then be forced to seek additional funding from Congress or Air Staff, or may simply have to live with the requirements shown on the 1391.

Several individuals expressed the opinion that there seemed to be a tendency to program funds before requirements were fully identified (66; 76). In other words, a given "wedge" of funds is initially set aside for a project, in the belief that the funding will be refined later, as the requirements are developed and fine-tuned (3). Brigadier General Joseph Ahearn, former Chief of the Programming Division at HQ USAF, commented that he felt that the Air Force Board Structure tended to encourage this practice of programming before planning (3).

Relations Between the Facilities Acquisition and Systems Acquisition Communities. At the outset of this section, it should be noted that throughout the interviews with systems acquisition and facilities acquisition personnel, there were few instances in which a member of one community placed the blame for facilities acquisition problems squarely on the members of the other community. Instead, the individuals were quick to acknowledge the special difficulties faced by members of both communities. Thus, there does not appear to be appreciable antagonism between the two communities.

The processes by which new weapon systems and facilities are developed are entirely separate and, as a result, the members of the systems and facilities acquisition communities have limited contact with each other (102). As one interviewee noted, "They are in two different worlds, speaking two different languages, and they don't communicate very well" (90).

The systems and facilities acquisition regulations are one cause of this problem. One systems acquisition regulation, AFR 800-8, Integrated Logistics Support, provides only two paragraphs of limited information on facilities (28:12, 18); likewise, the civil engineering programming regulation mentions the topic of facilities to support new weapon systems only in passing (30:16). Thus, while all respondents agreed that civil engineering personnel need to be involved early in the weapon system development process, there appears to be no formal process by which this involvement is assured.

Early Civil Engineering involvement in the development of weapon systems may be quite limited. During a visit to the Air Force Institute of Technology in July, 1985, the Director of Air Force Engineering and Services, Major General Clifton D. Wright, noted one such example: "Civil Engineering did not get in early enough in the development of the F-15, and so now it is a very tight

squeeze to get the aircraft into the [European] shelters" (107). MGen Wright went on to comment,

> We are looking at the Advanced Tactical Fighter Statement of Need right now, and I'm convinced it needs to be "bounded" by the capabilities of our current facilities rather than require a major build program to satisfy its basing requirements. (107)

Question 22 of the interview questions asked members of the systems acquisition community how much knowledge of the overall facility acquisition process their job required. Of the thirteen individuals who responded to this question, five felt their jobs required some knowledge of the process. Only two individuals felt their jobs required considerable knowledge of the facilities acquisition process. Most said they depended heavily on civil engineering personnel for information on their facility needs for the systems.

Those individuals whose jobs required some knowledge of the process were also asked where they learned this information. While two individuals mentioned educational courses they had taken, the majority said they had learned how the facility process worked simply through "on the job training."

While the civil engineers who were interviewed were not specifically asked about their knowledge of systems acquisition, many individuals commented on this topic as well. For example, one individual noted that the introduction of a major weapon system such as the B-1B bomber

or Peacekeeper missile happens so infrequently that there is very little civil engineering expertise in how to support such a system (79). Even for less-than-major systems, the expertise at any one base or MAJCOM is likely to be quite limited (59). Thus, except for those engineers who work in specialized areas in support of systems, such as within the Air Force Systems Command, the average civil engineer will have little or no experience in supporting deployment of a major new system.

Because experience in providing support facilities for weapon systems seems to be somewhat limited on both sides, the next logical step would seem to be examining the regulations, to see whether they provide any additional information. To evaluate the adequacy of regulations, respondents were asked the following question: "Do you feel that regulations . . . provide adequate guidance on facility acquisition to the person in the field?" (question 16).

Nearly all the facilities acquisition personnel felt that the regulations provided enough information on facilities. Most systems acquisition personnel, on the other hand, felt that the regulations did not provide adequate information on facilities acquisition. One typical comment was that Civil Engineering would generally be called to check on proper facility acquisition procedures (102). Another comment was that perhaps more detailed information should be presented in the systems acquisition

regulations (59). However, other interviewees pointed out that because every systems acquisition program is unique, it would be extremely difficult to develop a regulation flexible enough to fit all situations (77).

Two other techniques which have been developed to ensure that facility requirements are considered early enough in the program are the Logistics Support Analysis and Integrated Logistics Support. As discussed in the literature review, these two techniques are designed to provide a formal procedure by which logistics support, including facilities, is routinely considered in the early stages of a system's development. However, the interviewees noted specific problems which have been encountered with these techniques.

For example, very little Logistics Support Analysis was done on the B-1A, the predecessor of the B-1B (27; 54). The reasons for this omission are unclear, although the omission may have been simply the result of having inadequate logistics support funds available (32). A limited Maintenance Engineering Analysis was done on the B-1A, but the analysis later proved to be inadequate for logistic support needs (27). Thus, when the order for 100 B-1Bs was placed in 1981, the airframe development began where the B-1A left off, while all logistics support functions had to essentially start from scratch (32; 69; 90).

A related Logistics Support Analysis problem with the B-1B was the fact that the weapon system, the support equipment, and the support facilities were all being developed simultaneously (27; 69). This problem of concurrency, as it is known, prevented adequate use of Logistics Support Analysis for the B-1B (27). Because Logistics Support Analysis is an iterative process, continually refined as the system itself develops, the total facility requirements would not have been available until the end of the weapon system development cycle (27). Unfortunately, this information would have arrived much too late for the Military Construction Program to react (27; 90).

One final important aspect of the requirements identification issue concerns the focus of <u>responsibility for facilities</u>. As noted earlier in this chapter, the base civil engineering organization is responsible for documenting the facility requirements. Thus, the System Program Office has no formal power in the facilities acquisition process. The Program Manager is primarily concerned with insuring that the weapon system is developed and deployed on time. The Deputy Program Manager for Logistics must work with civil engineering personnel to provide facilities on time, but has no formal authority in this area, especially in terms of facility funding. This discrepancy was discussed extensively in the literature review, and the results of the interviews confirm this problem.

In questions 27 and 28 of the interview, individuals were first asked to what degree the Program Manager was involved in the facility acquisition process, and then asked whether they felt that increasing the visibility of the support facility requirements to the Program Manager would be an appropriate measure to improve the facility acquisition process.

A common observation was that the level of Program Manager involvement depends on both the program and the Program Manager himself (90). In other words, there appears to be no prescribed level of Program Manager involvement. In general, however, most of those interviewed felt that because Program Managers were involved with so many different aspects of weapon system support (personnel, technical orders, support equipment, and facilities), they often paid little attention to the facilities portion of the program until trouble developed, which often proved too late.

In response to the second question, most individuals felt that making Program Managers more aware of facility needs would be beneficial. However, one individual added that

> You can bring it to the attention of the Program Manager all you want, but the fact is, the Program Manager doesn't control the facilities programming for a new weapon system. His report card is not graded on how well he articulates the facility requirements for his weapon system. (59)

Within the simulator programs, the Program Managers were generally thought to already be quite involved in facilities, because of the close relationship between the equipment and the simulator facility (75).

Requirements Solutions. Just as the interviewees had various perceptions of problem areas, they also provided a number of different solutions to reduce or eliminate these problems. A summary of the most frequently mentioned solutions is presented in this section.

Define Requirements Earlier. The most common solution proposed to alleviate the requirements identification problems was to simply define the requirements earlier. A total of seven individuals made this suggestion; four of these felt it was the most important long-term solution to facility acquisition problems.

Several individuals felt that facility requirements needed more conscious attention in the early stages of the program. For instance, one individual felt that systems acquisition personnel should force the weapon system contractor to more precisely define the maintenance plan for the system (44). A comprehensive maintenance plan would allow for more accurate definition of support equipment needs, which, in turn, heavily influence maintenance facility requirements. A variation on this idea is that the Air Force develop a better definition of exactly what

facility characteristics are needed from the weapon system manufacturer in his Facilities Requirements Plan (70). Finally, some individuals cited examples of where the Air Force actually gave the systems contractors certain basic facility criteria, such as the size of the facility and the power requirements, and asked that the contractors design their equipment to meet those constraints (53). This suggestion was particularly prevalent among individuals associated with simulator programs.

Involve Support Functions Early. Another solution was to ensure that all support functions were involved early in the requirements identification process. One approach used at HQ SAC for the Peacekeeper missile was to ask that each directorate assign a Peacekeeper project officer (96). These project officers then met regularly to coordinate the work being done by their respective directorates, and to develop facility requirements (96). Similar suggestions were made for base-level operations as well. For example, the requirements for the Air Launched Cruise Missile beddown at Wurtsmith were developed using a base working group (94). Without early user involvement, special requirements often surface after construction begins, resulting in costly change orders (19).

One method proposed by the respondents to insure that all support elements are involved early in the program

is to baseline the requirements. As discussed in the literature review, baselining is the procedure by which all participating organizations, including the logisticians, agree to the program requirements and funding in the early stages of the program (84). Two individuals mentioned program baselining as being the most important long-term solution. Respondents cited several advantages to baselining. For example, it promotes early communication among all involved organizations, including those of logistics and facilities (24; 63), and it forces early agreement on requirements and funding levels (24). These benefits in turn contribute to the overall stability of the weapon system program (59; 63). In the case of the B-1B program, all of the system's funds were baselined except facilities (90). The apparent reasoning behind this decision was that the DOD directive requiring certain major programs to be baselined did not specifically address facilities (90).

Baselining may also be used to reduce the problem of "get wells" (i.e., building new facilities when existing facilities might be adequate to support a new mission), by making it more difficult to change the criteria during the program (22). Another possible solution to "get wells" is to stress the concept of Life-Cycle Cost in making the decision whether to use a new versus an existing facility. While a new facility might have a substantially larger initial cost, its overall lifetime maintenance cost might

be lower than that incurred when attempting to renovate an existing facility (66). Other intangible factors, such as increased morale generated by modern work areas, also make it difficult to accurately evaluate the benefits of new facilities (34; 90).

Improve Accuracy of Programming Documents. Another consideration in requirements identification is the accuracy of the programming documents. As noted earlier, the programming documents submitted for approval may not always reflect actual requirements (11). One suggestion to improve the accuracy of programming documents is to develop a requirements data base and make it available to all base civil engineering programming personnel (59). This data base would also include a standard methodology for estimating costs, similar to those used in the systems acquisition field. The data base would make use of similar previous projects done in the Air Force. An example of a data base in the systems acquisition community is the "Lessons Learned" file, in which systems acquisition organizations publish the lessons they learned during the course of an acquisition program. One individual recommended that these existing "Lessons Learned" files be used more effectively (77). However, he also noted that advanced programs may have difficulty finding appropriate lessons for a program which does not resemble any work done previously (77).

A second solution proposed to increase the accuracy of the programming documents is to establish a feedback loop from the Air Staff to the bases. This feedback loop would not only notify a base that a particular project has been supported and will be sent on to Congress, but would also confirm that the requirements listed on the programming documents are, in fact, what the base needs (11).

Improve Regulations. Some individuals felt that the regulations did not provide enough information on facility acquisition procedures, and suggested that more detailed information be presented in the systems regulations. For example, one individual recommended placing a reminder in AFR 800-8, Integrated Logistics Support, emphasizing facility programming and the matching of facility completion schedules with equipment deliveries (76). A related solution is to cross-reference systems acquisition and facilities acquisition regulations (14). Others felt that having more detailed regulations would simply allow them to become outdated more quickly. Instead, as one individual noted, "the best thing is to have an experienced worker, someone who's worked with the DE [civil engineering] community before, and who can explain what mistakes to avoid" (77).

One individual commented that

> what these regulations don't address at all is what happens when you have a program that's driven from the top down, as all the big ones are. The regulations

> tell you how to implement a program according to Plan A, but if you cannot possibly do Plan A, they don't give you a Plan B. (90)

Accordingly, he feels there should be a separate regulation added to the 800-series regulations, for use in high-priority or national interest systems acquisition programs (90). There are already similar regulations for classified and "quick reaction" programs (90).

Improve Education. The most frequently mentioned solution in any area was education. Fifteen individuals mentioned this solution; four labeled it as the most important solution. The findings indicated that most systems acquisition personnel learned about the facilities acquisition process not through any formal courses or training, but through "on the job training." This lack of education, combined with the frequent turnover of key personnel due to military rotations, results in a constant relearning process for systems acquisition personnel (77; 90).

Some steps have already been taken to correct this problem. For example, students attending the Air Force Institute of Technology Systems 400 course receive information on how to provide facilities for their weapon systems in a block of instruction taught by Aeronautical Systems Division Civil Engineering personnel (59; 105).

Of course, this lack of education is not limited to the systems acquisition community. The results of this study indicate that many civil engineers have very little experience working with major systems acquisitions programs. Often, individuals associated with major programs such as the B-1B and the Peacekeeper had no prior experience working to support a systems acquisition program.

Several suggestions were made to remedy this situation. The first was to write a supplement to the Air Force Civil Engineering Programming regulation, AFR 86-1, geared solely toward military construction to support weapon systems (79). Second, four individuals suggested that the Air Force follow the lead of Air Force Systems Command, which has established an Acquisition Civil Engineering branch. Such an organization could then serve as the focal point for information relating to any systems acquisition construction within the Air Force (79; 85). Alternately, the Air Force could continue the technique used for the Peacekeeper system, and set a special agency dedicated solely to that weapon system (3). A variation of these ideas would be to establish a permanent civil engineering staff within each System Program Office (90).

Timing

The second most frequently mentioned problem area was the timing of the acquisition processes. Timing was

mentioned by 11 of the 51 respondents as being the most important problem area. Overall, 34 individuals mentioned timing concerns.

Analysis by Level. When the responses were examined by organizational level, the emphasis on timing shifted slightly. For example, while timing was the second most frequently mentioned problem area at the Aeronautical Systems Division and MAJCOM levels, it was the third most frequently mentioned area at the base and the HQ USAF levels, and only the fourth most frequently mentioned area at the AFRCE and Air Logistics Center level.

Base Level. At the base level, and to some extent, the AFRCE/Air Logistics Center level, timing was associated with the Initial Operational Capability date. The timing concerns of individuals at these levels were generally related to the problems they had encountered as they worked toward this critical date. Such comments included concurrency and delays in support equipment requirements, both of which forced redesign of facilities.

AFRCE/Air Logistics Center Level. At the AFRCE/Air Logistics Center level, the interviewees with the Peacekeeper program were concerned about the Congressional delays in basing and funding decisions, which had in turn delayed the start of facility design work. Despite

these delays of funding, however, the Peacekeeper Initial Operational Capability date had not changed significantly, a fact which further added to the time-sensitive nature of the construction program.

Aeronautical Systems Division Level. At the Aeronautical Systems Division level, similar concerns were expressed about concurrency and the support equipment review process. However, several individuals also commented on the effect of the Acquisition Improvement Program, noting that it would adversely affect the facilities acquisition program. In addition, some interviewees felt that the Planning, Programming, and Budgeting System was not a particularly effective system for linking the facilities and systems acquisition processes.

MAJCOM Level. The individuals at the MAJCOM level were most critical of the disparity between the systems acquisition and facilities acquisition cycles, citing this disparity as the source of many problems facing the facilities acquisition community today. Comments were also made on concurrency and support equipment problems, although not as frequently as in the lower levels.

HQ USAF/OSD Level. At the HQ USAF/OSD level, the results differed significantly from all other levels. While individuals at this level agreed that

concurrency and support equipment issues caused some problems in requirements identification, they rarely mentioned any problems with the timing of the Military Construction Program and systems acquisition cycles. They often noted that requirements should be identified early in a program, to enable the programmers to submit accurate cost estimates to Congress. However, unlike any of the other levels, they generally felt that the Planning, Programming, and Budgeting System was flexible enough to allow them to change requirements, even late in a program. This perception may be due to the fact that these individuals work with the system on a regular basis, are familiar with the process, and so have more confidence in its effectiveness.

Analysis by System. Examining the responses by system, rather than by organizational level, the results are not significantly different. The most prominently mentioned timing problem mentioned by the individuals in the B-1B program was concurrency, because of the simultaneous development of the weapon system, the support equipment, and the facilities. Many individuals also commented on the time pressures imposed by the Initial Operational Capability date at Dyess AFB.

In the Peacekeeper program, the concurrency problem was also mentioned, although less frequently than in the

B-1B program. In these instances, concurrency was generally associated with delays in the Congressional funding and basing mode decisions. These delays then forced facilities to be designed at the same time as the missile and its transport equipment. The time pressures associated with making the Initial Operational Capability date were frequently mentioned, because the data has slipped only six months since the start of the program, despite continued delays in the basing mode decisions.

Specific Timing Problems. One of the most frequently mentioned causes of timing problems was the fact that the facilities acquisition and weapon system acquisition cycles are out of phase. The differences in timing between the systems acquisition and facilities acquisition processes were noted in the literature review. Briefly, the key difference is that while the Military Construction Program cycle is constrained by the calendar submission dates of the Planning, Programming, and Budgeting System, the timing of a given systems acquisition program depends only on the milestones set for the program by the Program Manager or higher authorities (85).

An example of the differences between the two processes in the Peacekeeper program were noted by one AFRCE engineer. (See Figure 5.1.) In the development of the Peacekeeper system, the facility design was roughly

Weapon System	Support Facilities
	Pre-Design Conference
System Design Review	30% Design Review
	60% Design Review
Preliminary Design Review	90% Design Review
Critical Design Review	50% Construction Completed

Fig. 5.1. Timing of the Peacekeeper Systems Acquisition Process versus the Facilities Acquisition Process

30 percent complete by the time the missile's initial System Design Review was held (78). Facility design was roughly 90 percent complete when the Preliminary Design Review for the system occurred (78). Finally, construction of the facilities was nearly 50 percent complete by the time the missile's Critical Design Review took place (78).

The implications of this disparity are substantial. First of all, facility projects must be 35 percent designed by the time they reach Congress, or they will very likely be deferred until the following year. Thus, the facility design must start, even though the contract for the system may not even have been awarded. However, starting design work without sufficient design criteria often results in a number of design changes during the cycle as the system begins to develop.

To determine more specific perceptions of individuals in the field, the question of timing was posed to

the interviewees in three questions. The first timing question (number 19) asked, "Do you feel the regulations set realistic time limits for the facility acquisition process?" Of the 38 individuals who responded to this question, 17 felt the time limits were not realistic, 9 felt the time limits were realistic, and 12 indicated they did not know. One observation made during the interviews was that the facility acquisition regulations do not actually set the time limits; instead, the submission of programming documents is ultimately tied to the submission of the President's Budget to Congress in early January (44). A military construction call letter is published by HQ USAF every year detailing submission dates for the upcoming year (44).

In question 24 of the interview, respondents were asked to judge how well the time constraints imposed by the Planning, Programming, and Budgeting System tie in with those of the systems acquisition and facilities acquisition processes.

The results listed in Table 5.1 are for those 26 individuals who work regularly with the Planning, Programming, and Budgeting System. The remaining 25 individuals indicated that they did not work with the system, and so chose not to respond to this question.

While the results at first appear to be evenly divided, the differences between organizational levels

TABLE 5.1

HOW WELL DO PPBS TIME CONSTRAINTS TIE IN WITH SYSTEMS ACQUISITION AND MILITARY CONSTRUCTION CYCLES?

Very Well	2
Fairly Well	11
Not Very Well	5
Not At All	8

must also be considered. Of the thirteen individuals who felt PPBS worked fairly well or very well, eight of them were at HQ USAF, and three were at the MAJCOM level. Perhaps these perceptions are simply a result of the fact that individuals at higher headquarters are more familiar with how the system operates, and consequently have more confidence in its ability to perform effectively. One individual at HQ USAF commented that

> the problem is that our counterparts at the MAJCOM level don't truly understand the process sometimes, and they get very impatient, or don't understand what the challenges that we face here are, when we're tasking them to provide information of one sort or another. (57)

The third question (number 12) examined whether there were points during either the facility acquisition or systems acquisition cycle at which more of the problems seemed to occur. Most respondents felt that the problems occurred in the earliest stages of the program. For example, thirteen individuals felt most of the problems

occurred during the requirements identification phase. Seven individuals thought that most of the problems arose at or near the 35 percent design review stage. The most frequent explanation for this response was that facility design requires more detailed technical criteria than are required in the earlier programming stage, and these criteria may not always be available for the system. The ranking of timing problem areas and frequency of mention are presented in Table 5.2.

TABLE 5.2

TIMING OF PROBLEM AREAS

1.	Requirements Identification	13
2.	Design (35%)	7
3.	Before Full-Scale Development . . .	6
4.	Throughout the Cycle	3

A related problem often mentioned during the interviews was the fact that the Military Construction Program is not responsive to changes. In any research and development program associated with a new weapon system, facility requirements will almost inevitably be changed to reflect changes made in the system itself (73). However, the current Military Construction Program process does not readily adapt to changes in requirements. One view expressed during the interviews was that this fact must be simply

accepted, and that the Military Construction Program must be made flexible enough to adapt to these "known unknowns" (3).

Others took a different approach, saying that the Military Construction Program should be flexible up to an agreed-upon point in time, but that any changes beyond that point should be made to the system, and not the facilities (10; 71). This philosophy was used to some extent on the cockpit procedures trainer for the B-1B bomber (53). Because the facilities contract was awarded before the simulator contract, the simulator contractors were advised of certain facility criteria, such as the size limitations, and were asked to design their simulator equipment to fit these criteria (53).

Several individuals disagreed with this philosophy, however. One noted that the facility acquisition community is there to support the systems acquisition process, and that it should not be allowed to drive the acquisition process (68). One obvious measure of the relative importance of facilities is to consider the differences in cost. One individual noted that having only a single B-1B arrive late to the base costs more than all the facilities at the base put together (69).

The timing of two programs in particular received a considerable number of comments during the interviews: simulators, and support equipment. Both types of equipment

have relatively short lead times: in the case of simulators, roughly 26 to 30 months (75). Thus, providing facilities to house this equipment presents special problems.

Simulators require very precise integration of the facility with the equipment. Simulator facilities must be built to these exact specifications so that computer lines and power cables will fit correctly. The problem is that the differences in lead times mean that design work on the simulator facility must begin nearly two years before the simulator equipment contract is even awarded. So, facility design engineers have virtually no information on the dimensions of the simulator equipment as they start their design. Also, if simulator facilities are not completed by the time the simulator equipment is delivered, the Air Force must pay for the storage of the equipment. Such storage fees average $60,000 per month (75).

Support equipment faces many of the same kinds of problems. Notification of support equipment requirements is frequently delayed while a contractor is selected to design the equipment (27). Once design begins, the support equipment may change dramatically from the plans that the facility engineers were originally given (27; 90). Unfortunately, the maintenance facilities to house that equipment need to have been programmed some two years previously.

Because of the "exotic" requirements called for by support equipment in terms of ventilation, conditioned air, and power supplies, maintenance facilities typically present the most problems during construction (26).

The Acquisition Improvement Program. One final area of consideration in the timing section concerns the impact of the Acquisition Improvement Program on facilities acquisition. Two of the initiatives in particular have the potential for influencing the timing of acquisition cycles: Initiative Number 2, Increase the Use of Preplanned Product Improvement; and Initiative Number 4, Increase Program Stability.

As its name implies, the goal of the Acquisition Improvement Program is to improve the systems acquisition process. However, during the interviews, some individuals raised questions about the benefits of the program. While some felt that because of the rapidly-changing weapon system and support equipment requirements, Preplanned Product Improvement was the only way to provide facilities on time (90), this proposal would, of course, require modifying facilities after initial construction is complete. Yet facility programming regulations strongly discourage making changes to facilities within one year of the initial construction (32). In addition, these later changes may cost considerably more than would be the case if the

changes had been included in the original construction (10). The major criticism leveled at Preplanned Product Improvement is that its goal of shortening the acquisition cycle will make it even more difficult for the Military Construction Program to provide facilities in time (95).

One criticism of the Acquisition Improvement Program in general is that it does not adequately address facilities in its initiatives (41; 95). One individual commented,

> the Acquisition Improvement Program is always looking to shorten the acquisition process and get the weapon system out to the field sooner, but there's a direct conflict between that and facilities acquisition . . . [and] the methods they are approaching it with don't address how to shorten up programming, design, and construction. (90)

When asked about program stability, most individuals agreed that increasing the program stability for the weapon system would help the facilities acquisition process as well (77). However, some individuals felt that the systems acquisition program needed to be flexible in order to provide the best possible product, even if this flexibility meant deviating from the original schedule (71).

Timing Solutions. By far the most frequently mentioned solution to timing problems was to link more closely the systems acquisition and facilities acquisition programs. All nine individuals who mentioned this solution

cited it as being the single most important solution available. Most individuals also agreed that some type of legislative changes are also needed to bring this solution about. Following is a discussion of some of the more common approaches mentioned to reduce timing problems.

Streamline the Military Construction Program. Many of the suggestions dealt with the need to streamline the Military Construction Program so that it would be more responsive to the needs of the systems acquisition community. The former Vice Commander of Air Force Systems Command, Lieutenant General Bernard Randolph, noted that "civil engineering laws are out of step with the way we normally procure systems" (73). He went on to note that "legislation is critical, in my view, and has been critical for a long period of time" (73). This legislation would be designed to allow facility changes to be made on something other than the normal, rigid calendar submission schedule (73).

One of the most comprehensive programs in this area has been proposed by the Air Force Systems Command DCS for Engineering and Services, Colonel William R. Sims. He has proposed a legislative initiative designed to eliminate certain calendar constraints from the facility acquisition process in support of systems beddowns (85). Perhaps the most revolutionary aspect of the initiative is the plan

to establish a "Systems MilCon" fund, patterned after the current P-341 Unspecified Minor Construction program (85). Colonel Sims acknowledges that the existing Military Construction Program cannot keep pace with the systems acquisition cycle (85). Thus, he argues that there is a pressing need for a special funding program which is flexible enough to adapt to rapidly-changing requirements and accelerated deployment schedules (85).

Opinions are divided on the merits of this controversial plan. Perhaps the most common concern expressed during the interviews was that members of Congress would be reluctant to approve such a proposal, because it would be seen as reducing their control over military construction funds (50). This statement reflects the fact that

> the Military Construction Program is one of the smaller portions of the defense budget, but because of the construction work it brings to [Congressmen's] districts, it receives a great deal of attention from committee members as well as the general membership. (107)

Because the Systems Command initiative asks that a fund be set aside to support initial systems beddowns, Congress may be reluctant to relinquish any degree of control over the Military Construction Program (26).

Several individuals proposed ideas similar to certain aspects of the Systems Command initiative, even though they indicated they were not familiar with the initiative, per se. For example, they cited such things

as removing the Military Construction Program from the Congressional cycle as much as possible, and allowing off-cycle submittals as a normal course of action (105).

Changes in Systems Acquisition Process. Some individuals suggested changes in the systems acquisition process as well. One suggestion was to accelerate the schedules for the various System Design Reviews to match the start of the facility design process (78). Others urged that program stability for the system be maintained, to stay on schedule as much as possible (86). Finally, one individual urged that support equipment be developed concurrently with the weapon system, so that maintenance facility requirements would be available when needed (47).

Funding

Funding-related problems were the third most frequently mentioned problem area, with eight individuals citing funding as the most important problem area. In overall frequency of mention, funding problems were the fourth most frequently mentioned area, mentioned by 24 of the 51 interviewees.

Analysis by Level. The emphasis on funding varied considerably between the five organizational levels. For example, while funding was the fourth most frequently

mentioned problem area at the MAJCOM and Aeronautical Systems Division levels, individuals at the base level mentioned very few funding problems at all. At the AFRCE/ Air Logistics Center level, on the other hand, funding problems moved up to the third most frequently mentioned problem area. Finally, at the Air Staff and ASD level, funding was second only to requirements identification as the most frequently mentioned problem area.

HQ USAF/OSD Level. The results at the HQ USAF/OSD level reflect the relative importance of funding issues at the Pentagon. Several individuals at this level noted that money is the driving force at the Pentagon, and that much of the Air Staff's work is concerned with obtaining the necessary funds to support the various MAJCOMs. Many individuals at the Air Staff level commented on the Congressional control of Military Construction Program funds. Problems caused by delays in Congressional funding approval were particularly emphasized.

MAJCOM Level. At the MAJCOM level, Congressional funding delays were also seen as problem areas. However, individuals at this level felt that the O&M funding avenue provided a responsive alternative to the Military Construction Program, because it is controlled primarily by the MAJCOMs themselves. They also commented

that the "lump sum" funding approach used in both the Peacekeeper and the B-1B programs was quite effective.

Aeronautical Systems Division Level. Individuals at the Aeronautical Systems Division level were in general agreement that there were no major problems with funding for the B-1B program, because of its high visibility. They also agreed that the cost cap imposed on the B-1B by Congress and the President was effective, and that baselining in general represented a good way to stabilize program funding. In addition, a large number of individuals felt that giving the System Program Office more control over Military Construction Program funds would be beneficial to the facilities acquisition process.

AFRCE/Air Logistics Center Level. At the AFRCE/Air Logistics Center level, the delays in funding for Peacekeeper were clearly the most significant problem. Most individuals felt that the facilities program had received sufficient funding. However, certain individuals felt that perhaps the funds were driving the requirements, rather than the more accepted notion that requirements should serve as the basis for funding.

Base Level. Finally, at the base level, funding received relatively little mention. It was usually mentioned only in terms of funds needed for design work or change orders.

Analysis by System. An analysis of results by system revealed no additional patterns of response.

Specific Funding Problem Areas. One of the primary problems mentioned during the interviews concerned the differences between Military Construction Program funds (classed as 3300 funding), and systems acquisition funds (classed as 3600, or Research and Development, funding) (79). They represent two entirely separate funding sources, which undergo separate approval processes. Consequently, construction funds cannot be combined with Research and Development funds in any way (79).

However, many Program Managers are apparently unaware of this funding distinction (7). Thus, when facilities for a particular system begin to encounter delays or funding problems, the Program Manager's first response is often to offer to provide funds from the system to help out the facilities, only to learn that systems acquisition funds cannot be combined with construction funds (76).

A related issue concerns the Congressional approval processes for Research and Development and Military Construction Program funds. One individual noted that because of the facility lead times involved, a request to Congress for construction funds at a particular site is often Congress' first indication that the Air Force is planning to deploy a weapon system there (26). He went on to note

that, unlike the weapon system itself, which can always be relocated, facilities cannot be relocated once they are constructed (26). Thus, while Congress readily provides Research and Development funds to develop the system, it tends to delay the facility funding while it decides whether or not to locate a weapon system at a particular base (26). Yet, because of the rigid timing constraints associated with the facility acquisition process, facilities are one aspect of systems acquisition support which cannot afford funding delays.

One specific basing issue noted in the B-1B program concerned the possible closure of McConnell AFB. Shortly before most of the interviews were conducted, the Senate Armed Services Committee had deleted all $70 million in FY 86 Military Construction Program funds to the base (57). This funding question had not yet been resolved when this study was written.

Delays in Congressional funding approvals were noted at nearly every organizational level, and were especially prominent in the Peacekeeper program (74). Several respondents expressed particular concern over the problems caused when Congress fails to act on appropriations by the start of a new fiscal year, and so needs to enact Continuing Resolution Authority (59). As noted in the literature review, four of the seven military construction appropriation bills passed between 1977 and 1983 were

late (61:13). This subsequently causes additional delays in awarding of construction project contracts, which can have significant consequences for system beddown schedules.

Other Congressional funding influences were also noted. For example, one interviewee observed that "certain Congressional committees are more often interested in fiscal constraints than in the President's [defense] initiatives" (26). Also, Congress is generally more concerned with short-term savings, while the DOD operates within a Five Year Defense Plan (37). Such a Congressional perspective can sometimes lead to program stretchouts and reductions in the number of weapon systems (87). While these reductions may reduce initial program costs, the unit price of the weapon system is increased, and the beddown schedule is disrupted (87).

Another issue related to Congressional review concerns the accuracy of programming documents. It was emphasized in a number of interviews that it is especially important to present accurate project cost estimates in submissions to Congress (37; 59). The requirement that projects be 35 percent designed by the time they are submitted to Congress was established primarily to insure that more accurate cost estimates would be available to Congress (37).

Funding Solutions. The need for education has already been discussed in the previous section; however, it was also frequently mentioned as a relatively easy way to make Program Managers aware of the differences between construction funds and systems acquisition funds (76).

A much more controversial suggestion is to put the Program Manager in charge of the Military Construction Program funds (90). This suggestion was mentioned by five individuals, three of whom felt it represented the single most important solution. A common sentiment expressed during the interviews was that the Program Manager was simply not as concerned about facilities as with the system itself, because he has been given no authority for Military Construction Program funds (59). Setting aside funds specifically for construction to support system beddowns and then placing the Program Manager in charge of these funds would motivate the Program Manager to be more concerned about facilities (90).

These individuals also commented on the logic of combining facilities and systems acquisition funds. Because a major weapon system will almost certainly require support facilities, it makes sense to approve both the system and its support facilities together (95). This approach is certainly preferable to the current system of approving them separately and running the risk of having

the support facilities cancelled while the system itself continues to be developed (68).

If this idea is carried one step further, construction funds would actually be combined with the funds used to develop the weapon system itself (22). This suggestion was especially common in simulator programs, because under the current system, contingency funds are often needed for the storage of simulator equipment in case the facilities are not ready by the time the equipment is delivered (75).

However, many other individuals disagreed strongly with these proposals. The primary criticism involved the proposals' political implications. Placing the Program Manager in charge of construction funds would severely reduce Congressional control over a substantial portion of the Military Construction Program (22). These respondents feel it is extremely unlikely that Congress would agree to such a change (68). Even the advocates of this proposal conceded that overcoming Congressional resistance would be very difficult (95).

Another political problem of sorts is that under this proposal, the Program Manager would, in effect, be able to control a major portion of a base's construction program (59). One individual felt that the bases would be unwilling to have an outside source dictating their construction program (59). In fact, one respondent felt it was important to give commanders in the field more power to

decide how much to spend on Military Construction within their Major Command (83).

Still other individuals were reluctant to put Military Construction Program matters in the hands of the Program Manager, because they felt that all facility concerns should remain with the civil engineering community, which has the necessary expertise in facility work (3:34). One specific example concerns the AFRCE Ballistic Missile Organization (BMO) and Ballistic Missile Support (BMS) organizations (106). Major General Clifton D. Wright, Director of Air Force Engineering and Services, commented,

> The members at the BMO want to put MilCon under direct control of the Program Manager rather than under AF/LEE [Engineering and Services] through the AFRCE-BMS at Norton AFB. I do not agree with that and have not concurred in the proposals to do so because of the need to maintain day to day oversight of the execution of the design and construction program. Additionally, the AFRCE-BMS handles the environmental assessment and impact statement process. This is very politically sensitive, and we need to be directly involved on a real time basis. (107)

Several solutions were proposed to address the problem of delays in Congressional funding approval. One was to allow construction projects to be advertised before the military construction budget is approved by the combined House and Senate Appropriation Committees (69). A variation of this suggestion is to include facilities in an Early Acquisition Buy program, such as the type used for the B-1B aircraft (69). Under this program, contracts for the weapon system were awarded before funds were

available (69). This program was initiated with Congressional approval, and was apparently unique to the B-1B program (69).

A more comprehensive solution which has been proposed is the two-year federal budget cycle (24). Submitting a budget every two years would enable planners to consider more long-range proposals, and would allow Congress more time to consider the defense budget (24). Other individuals, however, feel that a two-year budget would simply give Congress more time to debate the defense budget, and would not measurably improve the current situation (18).

On a more positive note, recent changes in civil engineering programming regulations which allow more Operations and Maintenance (O&M) funds to be used for system beddowns were viewed as being quite beneficial (46). In the 1970s, AFR 86-1, Programming Civil Engineer Resources, included the so-called "single project rule" for system beddowns, which required that all construction work required to support a new mission be done under a single project (79). This rule had all but eliminated the use of O&M Minor Construction funding, because of its $200,000 limit (79). It also meant that Military Construction Program funds had to be used for virtually all system beddowns (79). Now, however, AFR 86-1 has been changed to allow multiple Minor Construction projects to be used for

new mission beddowns, as long as no one project exceeds the $200,000 limit (46). All of the interviewees who commented on this change felt that it was a very positive step which greatly aided the facilities acquisition process.

The increased use of Operations and Maintenance funds to support new missions has caused some additional problems, however. Air Force policy currently limits Minor Construction funding to only 15 percent of its total Operations and Maintenance budget because of Congressional concerns that essential Maintenance and Repair work might be neglected in favor of new construction (101). However, the large number of Minor Construction projects needed to support a new weapon system has taken up increasingly larger portions of the annual Minor Construction budget (46). Therefore, one individual suggested that the Air Force needed a separate budget item in the O&M program dedicated solely to systems beddowns (46). He also indicated that the Air Force was considering raising the 15 percent Minor Construction limitation (46).

A number of individuals from the B-1B and Peacekeeper programs commented on the effectiveness of using "omnibus 1391s" (41; 69). An "omnibus 1391" is a generic programming document which lists in general terms the facilities required at a given base, and which simply assigns lump sum cost figures to these facilities, rather than breaking out the costs in more detail (41; 69).

Because of the delays in funding and basing decisions for both the B-1B and the Peacekeeper, Congress allowed the omnibus 1391s to be submitted, and then approved one lump sum for facilities construction for the entire base (69). Thus, the civil engineers at the base are allowed to allocate these funds to the various individual facilities, as needed (41). Then, if construction of a particular facility cost less than expected, the funds could easily be used for other system-related facilities on base, without notifying Congress of the changes (69). Each of the individuals who mentioned this technique felt it was extremely beneficial, and recommended it be used for other weapon system beddowns in the future (11; 67).

Baselining was a commonly mentioned solution to funding problems. However, a few individuals expressed some reservations about the use of baselining. One felt that baselining would encourage organizations to "pad" their initial budget baselines (78). A similar criticism was that a program could face problems if the original baseline was set at an unrealistically low funding level (90). Finally, because baselining makes it more difficult to change criteria during a program, one respondent felt that baselining would in effect "tie our hands" in the development of facilities and other support elements for the weapon system (42).

Communication/Coordination

The fourth most frequently mentioned problems were those relating to communication and coordination. Three individuals cited such problems as being the most important problem areas, and overall, fourteen of the fifty-one interviewees mentioned communication and coordination problems.

Analysis by Level. The relatively low level of emphasis on communication and coordination problems was consistent in four of the five organizational levels. However, individuals at the base level had a significantly different perception of the communication/coordination issue. It was tied with requirements identification as being the most frequently mentioned problem area.

Base Level. This strong emphasis on communication and coordination at the base level is perhaps due to the fact individuals must deal not only with other base organizations, but also with the Corps of Engineers, local agencies, and higher headquarters. It may also be a result of the fact that base level personnel are ultimately responsible for the actual deployment of the weapon system, and so they are totally dependent on information provided to them by other organizations.

HQ USAF/OSD Level. At the HQ USAF/OSD level, individuals most often mentioned the importance of dealing effectively with Congress. However, they often observed that they felt individuals at the bases and MAJCOMs did not understand the pressures and priorities affecting them at the Air Staff level. Perhaps there is something of a communication barrier between HQ USAF and the other levels of command. The rather striking differences in responses between the MAJCOM and HQ USAF levels noted earlier in the Timing section of this chapter might also indicate that communication could be improved between these two levels.

Analysis by System. An analysis of the results by system did not reveal additional communication and coordination problems common to a particular system.

Specific Communication/Coordination Problem Areas. Some communication and coordination problems have already been noted earlier in this chapter. For example, the problems between the facilities acquisition and systems acquisition communities were considered in the Requirements Identification section. However, several other types of communication and coordination problems were also mentioned throughout the interviews.

Many of the comments in this section relate to base level operations. Because individuals at the base

are closely associated with other base organizations, they are quite conscious of the need for effective communications. One individual at the base level also noted that he felt somewhat isolated from the decision-making process (67).

Site Activation Task Force. One organization designed to improve coordination at the base level is the Site Activation Task Force, or SATAF. The SATAF is an Air Force Systems Command organization which operates at a base which is to receive a major new weapon system (69). It acts as an autonomous group, coordinating all aspects of site activation, from the weapon system itself to the support facilities (67). Members of both the B-1B SATAF at Dyess AFB and the Peacekeeper SATAF at F. E. Warren AFB were interviewed during the research.

While most individuals felt that SATAFs were effective, some minor problems with their use were mentioned. For example, because the SATAF is an outside organization which suddenly begins operating at a base, it can sometimes cause friction with existing organizations. One individual mentioned that the B-1B SATAF met with two distinct reactions as it began work at Dyess AFB (69). Some organizations on base saw the SATAF personnel as being the resident experts on all aspects of the B-1B, and so they constantly looked to the SATAF for guidance (69). Other organizations,

such as the Base Civil Engineering organization, appeared to view the SATAF as something of a threat to their own organization (69). After all, the programming work for the facilities had all been done by the base civil engineering organization, and they saw no reason for another civil engineering organization on base (69). Interviews with members of the Civil Engineering organization at Dyess confirm that this was, in fact, their initial reaction to the SATAF (11; 13). However, they were quick to point out that without the use of the SATAF and similar base working groups, the B-1B could not have been fielded nearly so effectively, and so they viewed the SATAF as an essential part of the deployment effort (11; 13).

U.S. Army Corps of Engineers. A second major communication/coordination problem area was the coordination with the Army Corps of Engineers. Both the Army Corps of Engineers and the Navy Facilities Engineering Command serve as the Air Force's design and construction agents for all Military Construction Program projects because, by law, the Air Force is not allowed to act as its own design and construction agent.

One of the major criticisms of the Corps of Engineers was the fact that because the Corps was not going to be the user of the completed construction project, it was not as concerned about the work as it was about its own

projects (94). The Deputy Director of Air Force Engineering and Services, Brigadier General George Ellis, commented that,

> No matter how interested the Corps of Engineers guy is in an Air Force project, I can find an Air Force guy more interested--because he has to live with it and operate it. (34)

A related problem is that because of the Corps of Engineers involvement, many base civil engineers may not be as concerned about the Military Construction Projects on their base as they are about the O&M Minor Construction projects, for which they are held responsible (34).

Some interviewees felt that the Corps of Engineers does not always recognize Air Force project priorities. For example, even though the B-1B bomber represents one of the primary strategic modernization initiatives for the Air Force, there was some question whether the Corps of Engineers shared the Air Force's sense of urgency in preparing for the initial basing of the bomber (69).

One individual felt that the Corps of Engineer's method of managing projects could also be improved. Currently, the Corps of Engineers has three branches: Engineering, Construction Management, and Contract Administration (94). There is generally little involvement of the Construction Management and Contract Administration branches in the early stages of the project (94). Also, there appeared to be no one office charged with overall management

responsibility for a project (94). Instead, responsibility was simply shifted from branch to branch as the project progressed through various stages of design and construction (94).

Relations with Local Authorities. A third communication/coordination problem area concerned relations with state, county, and local agencies. This problem was mentioned frequently during interviews with individuals in the Peacekeeper missile program. For example, at F. E. Warren AFB, some of the local agencies the SATAF deals with include the Federal Highway Administration, for construction of the Defense Access Roads, as well as the State and County Highway Departments, who will maintain the roads (67). The members of the SATAF also deal with state officials who are concerned about the economic impact of the Peacekeeper deployment on the Cheyenne, Wyoming, economy (41). Finally, the SATAF must deal with influential local land owners, who are concerned about the effects of the construction work being done on their land (41; 67). Each of these groups can have a substantial effect on the success of the construction effort, and so members of the SATAF must work closely with each to satisfy their needs.

At times, the interaction with these groups is not the problem so much as is convincing higher headquarters

that it is important to deal with them (41; 67). Some individuals commented that the individuals at HQ USAF did not always appear to understand how influential these groups were, and why it was necessary to maintain good relations with them (41; 67).

Prime versus Associate Contractors. There were also some communication/coordination problems noted on the systems acquisition side. For example, some individuals commented that neither the Peacekeeper nor the B-1B program was using a Prime Contractor to coordinate the work of the thousands of subcontractors (62; 90; 104). Instead, as in the case of the B-1B, the Air Force Systems Program Office was essentially serving as the Prime Contractor, working with four associate contractors for the airframe, offensive and defensive avionics, and the engines (42). In both the B-1B and the Peacekeeper programs, the apparent reason for not using the traditional Prime Contractor approach was to save money; however, some individuals questioned whether the "Air Force as Prime Contractor" approach actually saved money (74; 104). Most individuals interviewed in the Aeronautical Systems Division felt the associate contractor approach worked well for the B-1B. On the other hand, the general sentiment expressed in the facilities portion of the Peacekeeper

program was that the Air Force should go back to using a Prime contractor (104).

Communication/Coordination Solutions. Following are the most commonly mentioned solutions proposed during the interviews to improve communication and coordination.

Improve Organizational Structures. One interviewee noted that it was very important to establish the proper organizational structure as soon as possible when preparing for a new weapon system (57). In the case of the B-1B bomber, this individual felt that a number of problems could have been avoided had there been a focal point for all B-1B matters at both HQ USAF and HQ SAC from the very beginning (57). He also suggested that this focal point be someone with sufficient rank and authority (57).

Another proposal was to write a Construction Management Plan early in the program, which clearly spells out the duties and responsibilities for all organizations involved in a major construction project, and establishes the various facility working groups (41; 67; 100).

The use of SATAFs for any major systems acquisition project was highly recommended (67). Because SATAFs operate right at the affected base, they can provide a valuable tool for coordinating the efforts of all base organizations (67).

Several individuals also commented on the effectiveness of working groups and facility boards (13; 74). Both the Peacekeeper and the B-1B made extensive use of facility working groups (13; 74). For example, in the Peacekeeper program, the facility change board was instrumental in reducing the cost of facility engineering change proposals (74). Other groups, such as the executive review group, composed of general officers, met quarterly to resolve any issues that had not been settled at lower levels (41). The key benefit of these groups appears to be that they enable everyone to learn what the other organizations are doing and how it may affect them (74).

Two organizations seemed to have been the subject of considerable interest from a number of interviewees: the Air Force Regional Civil Engineer (AFRCE) organization, and the Army Corps of Engineers. While one individual felt it was beneficial to establish a separate AFRCE organization for the Peacekeeper (3), another thought the three existing AFRCEs were adequate, and that creating a new AFRCE caused additional coordination problems (78). An additional suggestion was that the AFRCE Ballistic Missile Organization should be combined with the AFRCE Ballistic Missile Support organization to improve communications (67). The AFRCE-BMO develops the missile system, while AFRCE-BMS is concerned primarily with providing support facilities for the missile. Finally, Brigadier General George Ellis,

the Deputy Director of Air Force Engineering and Services, said he would eventually like to eliminate the AFRCEs and give the construction management responsibility to the affected MAJCOM (34).

Comments concerning the Corps of Engineers also varied considerably. For instance, several individuals praised the use of the Special Projects Group established by the Corps of Engineers for systems with multiple bed-downs, such as the Air Launched Cruise Missile (94). In this case, one central agency was responsible for the design work for every ALCM base, no matter where the base was located (94).

However, there were several more negative comments concerning the Air Force/Corps of Engineers relationship. Several individuals recommended that the Air Force be allowed to act as its own design and construction agent (94). However, it was also conceded that the legislation required to make this change would be difficult to obtain (94). Major General Clifton D. Wright, Director of Air Force Engineering and Services, says that he sees no chance of this change occurring, primarily because of the manpower increase that would be required within Air Force Civil Engineering (107).

Other individuals felt that while the Corps of Engineers should continue to act as the Air Force's design and construction agent, the Air Force should at least work

toward gaining a larger role in Corps of Engineers projects (71), and should also force the Corps of Engineers to be more responsive to Air Force nedds.

Improve Information Flow. Several interviewees suggested techniques for improving the flow of information during project development. For instance, the use of "cradle-to-grave" project management was suggested to ensure continuity in a project (67). This concept is now being used by both the Peacekeeper office (96) and the B-1B office at HQ SAC (47). One individual also suggested that some type of formal reporting procedure be established for the MAJCOMs to regularly relay the status of systems construction projects to the Aeronautical Systems Division Civil Engineering office (95). Finally, several individuals from Air Force Systems Command recommended that facility status be briefed using separate briefing slides during Integrated Logistics Support Briefings, rather than being treated simply as one of several logistics sub-elements (10; 85).

One proposed solution concerned the monthly status report briefings given for the B-1B. Major General Thurman, the former Program Manager for the B-1B, spent much of his time each month briefing various levels of command on the status of the program. One individual, speaking off the record, suggested that too much time was being spent

briefing organizations which were located between Aeronautical Systems Division and OSD in the chain of command. Therefore, he proposed that all four Program Divisions within the Air Force Systems Command (Aeronautical Systems Division, Electronic Systems Division, Space Division, and Armament Division), be combined into a single Air Staff agency, in much the same way as the Air Force Regional Civil Engineering organization reports directly to the Air Staff. Of course, the physical locations of the divisions could remain the same. However, by combining the divisions into an Air Staff agency, Program Managers would not be forced to brief so many intermediate levels of command before reaching OSD. He also argued that many of the decisions affecting the Program Divisions are made at the OSD or Air Staff level, so that making the Program Divisions into an Air Staff agency would also enhance the communication flow.

Political

Problems related to political or legislative issues represented the fifth most frequently mentioned problem area. While thirty of the fifty-one respondents commented on this problem area, only two individuals felt it represented the most important problem area. These results may have been due to the sensitive nature of the issue, and the fact that many individuals were somewhat

reluctant to discuss these political issues in any detail. It should also be noted that the interviews included three questions relating to political influences, and so individuals were specifically asked to address the issue of political influences.

Analysis by Level. Individuals were asked whether political influences represented a significant problem in the acquisition processes. At both the base and Aeronautical Systems Division levels, the respondents were evenly divided between those who viewed political influences as problems and those who did not. However, all five individuals at the AFRCE/Air Logistics Center level felt that such influences represented significant problems. Similarly, of the ten individuals who responded to this question at the MAJCOM level, eight felt political influences were problems, while only two did not view them as problems. Finally, it is interesting to note that of the nine individuals at the Air Staff and OSD level who responded, six felt that political influence was not a problem, and only three individuals felt it was a problem. This finding may have been due to their familiarity with the political system, or it could also be related to the fact that many of these individuals deal regularly with Congress, and so were reluctant to express a controversial opinion in this area.

Despite the differences in perceptions between levels on whether or not political influences represent problems, one consistent trend noted at every level was that individuals regarded political influences as simply a "fact of life" over which they had little control. Most individuals also acknowledged that although political influences cause problems at times, they are an inevitable result of a democratic government which will not change in the foreseeable future.

The two most frequently mentioned political problems were basing changes and Congressional funding delays. Changes in basing were mentioned at all organizational levels, but they were cited as causing significant problems by those individuals at the base, AFRCE/ALC, and ASD levels. Many of these individuals felt that the changes in beddown schedules were often the result of political interests trying to secure construction work in a particular Congressional district.

The most frequently mentioned funding problems were the delays in Congressional approval of funds for design and construction. Most individuals seemed generally satisfied with the amount of funding for their programs, but the problems caused by the timing of the approval process were noted by all organizational levels.

In general, individuals did not feel there were significant political influences at their own working level.

They more often viewed political influences as being those which originated at some higher level, and over which they had little control. In particular, the respondents at the base level felt that they had very little influence in the decision-making processes. Instead, they more often felt that they were simply told by higher headquarters to prepare for a new weapon system.

Analysis by System. When the results are examined by system, other patterns of response become evident. For example, in the B-1B program, political concerns moved up to become the second most frequently mentioned area. However, it should be noted that several individuals within the B-1B program felt that political influences had been beneficial to the program, in terms of increased visibility and funding. The most frequently mentioned negative political aspect was that of changes in basing. Most respondents in the B-1B program commented on the decision not to deploy the B-1B to Wurtsmith AFB, as well as the possible closure of McConnell AFB, which is currently planned as the fourth B-1B base.

The Peacekeeper missile program was generally viewed as one of the most politically sensitive programs to date. For individuals in the Peacekeeper program, political problems were tied with timing problems as the second most frequently mentioned problem areas. The

problem of continued basing mode changes for the missile system were most often cited as causing facility acquisition problems. Because of the political nature of the Peacekeeper program, two individuals elected to speak off the record in this area.

Members of tactical fighter programs cited frequent beddown schedule changes as being the most prevalent form of political influence. The simulator programs to support these tactical systems experienced similar problems in attempting to change their basing plans.

Specific Political Problem Areas. Most of the comments presented in this section were obtained in response to three questions near the end of the 35-question interview. Question 31 asked the respondents to comment on the effects of political influences, first at their working level, then at higher levels of command (MAJCOM, HQ USAF, and OSD), and finally, at the Congressional level. In question 32, they were asked whether such influences represented a significant problem in the acquisition process. Finally, in question 33, they were asked to suggest a method by which the effects of such influences could be minimized.

As noted at the beginning of this section, respondents generally did not perceive a great deal of political influence at their own working level. Most individuals

tended to direct their comments on political influence to the areas of Air Staff and Congressional involvement in the acquisition process. For example, a frequently mentioned issue was that Congressmen are interested in bringing business and construction funds into their Congressional districts, and so take great interest in the Military Construction Program. This interest is reflected in the care with which Military Construction Program submittals are examined (26). Members of the House and Senate Armed Services Committees have primary responsibility for evaluating and approving the Military Construction Program submission; however, all other members of Congress are also given the opportunity to testify in behalf of a particular project in their state or district (26). To aid in this process, Military Construction line items are presented by state, rather than by system or service (70).

The most commonly mentioned problem area relating to Congressional influence was basing. Tactical systems appear to be especially prone to basing changes due to political pressures because tactical systems are generally smaller and less expensive than strategic systems (105). For instance, there are only a limited number of places where the B-1B can be based, "because of its weight, the size of the aircraft, the runway lengths required, the base security requirements, and its strategic importance" (105). On the other hand, "tactical forces can be sent almost

anywhere, including commercial airports, which are used by some Guard and Reserve forces" (105).

One notable strategic system which did have considerable difficulty with its basing mode was the Peacekeeper missile system. Basing options for the system were not only influenced by formal legislative processes, but also by pressure from the general public (74). During the Carter Administration, Public Hearings were held as part of the Environmental Impact Assessment process for the Multiple Protective Shelters basing concept (74). This process represented one of the largest environmental assessments ever done in the Air Force (41). The Multiple Protective Shelter plan called for placing 200 missiles in 4600 shelters located primarily in Nevada and Utah (74). However, the public response when this basing mode was announced forced planners to reconsider the decision (74). Later, when the Reagan Administration announced the plan to put Peacekeepers in existing Minuteman silos in Wyoming and Nebraska, it set off yet another controversy over the vulnerability of the missiles to a Soviet attack (74).

One individual in the Peacekeeper program noted that he had done documentation for some 35 different basing proposals (74). Another individual commented that the seemingly endless series of basing proposals sometimes made it difficult to keep employees motivated (41).

Another problem with changes in Peacekeeper basing modes was that despite continued delays in the selection of the basing plan, the Initial Operating Capability date, originally set for July 1986, changed very little: it is currently set for December 1986 (74). While such scheduling ties in well with the program stability aspect mentioned in the Acquisition Improvement Program, it causes considerable difficulty for the construction of facilities (74). For example, approval of the Peacekeeper construction funds for Fiscal Years 83, 84, and 85 was delayed by Congress so that all funding was essentially approved at one time (74). Thus, while the missile system itself was being developed, the funds needed to begin facility design were being held back by Congress (74).

The B-1B bomber also experienced political difficulties, most notably in 1978, when President Carter cancelled the program in favor of the Air Launched Cruise Missile (81:94). More recently, there has been some question concerning the proposed basing for the bomber. It is currently scheduled to be located at four bases: Dyess AFB, Texas; Ellsworth AFB, South Dakota; Grand Forks AFB, North Dakota; and McConnell AFB, Kansas (63). However, a General Accounting Office report has suggested that it might be most cost effective to use only three bases (63). Of course, the most cost-effective approach may or may not

be the most practical one from a strategic point of view (63).

The fact that Congress is considering closing McConnell AFB, currently planned as the fourth B-1B base, was also mentioned in the interviews (90). Several individuals in the facilities acquisition community acknowledged that they were concerned over the prospect of another change in the B-1B basing plan (44). Such a change would then mean that either programming of facilities would need to begin immediately at a new base, not previously considered for the bomber, or more likely, that current facility requirements at the three remaining B-1B bases would need to change to accommodate a larger number of aircraft (90).

One important point to consider regarding basing changes is that facilities are one of the few support elements which are affected by a basing change (105). As one interviewee noted, "the aircraft doesn't care whether it's being sent to Base A or Base B, nor does the support equipment. But a basing change does impact the base severely, in terms of facilities" (105). If a system beddown is merely delayed at a base, it does not cause a great many problems, because at least facilities will be ready when the system arrives later (105). What causes more severe problems is either an accelerated basing schedule, or a decision to put a system into a base which had absolutely

no warning that the system would be coming, because the Military Construction Program simply cannot react quickly enough (105). Also, because of Public Laws, Military Construction Program funds are "base-specific," meaning that once they are allocated to a particular base, they cannot be transferred to use at another base if the weapon system basing plan is changed (105).

While both the Peacekeeper and the B-1B have experienced politically-related problems, it must also be noted that some individuals felt that political influence was helpful to their program. For example, a number of them felt that the fact that the B-1B was "the President's Bomber" helped the program considerably (11). They cited the increased visibility as a very positive benefit, especially in terms of funding.

Interview question 10 asked whether some systems were more prone to facility acquisition problems than others. Politically controversial systems were the second most frequently mentioned group (the first being complex systems using "leading edge" technology). Thus, political influences appear to be perceived as having the capacity to significantly affect major weapon system programs.

Political Solutions. Several solutions proposed to reduce political problems have already been considered earlier in the chapter, in the section on timing solutions.

These proposals included the legislative initiatives to streamline the Military Construction Program, as well as the Systems Command initiative to provide a "Systems Milcon" fund.

Improve Education. The single most frequently mentioned political solution was to educate individuals at all levels of command and in Congress (85; 105). This education would be designed to heighten awareness of facilities in the systems acquisition community (85). A related concern is the need for both the Air Force and DOD to improve their relations with Congress (74). Specifically, the Air Force needs to set credible requirements for its weapon systems requests, and then be prepared to defend them before Congress (104).

One interviewee related the story of the Air Force's handling of a particular Peacekeeper basing concept known as Closely Spaced Basing (74). Congress reportedly disapproved this basing plan because "the Air Force could not explain the concept of 'fratricide' to our satisfaction" (74). (Related to Peacekeeper, fratricide refers to the phenomenon whereby incoming Soviet missiles targeted on these very densely packed missile shelters would destroy each other before reaching their targets [74].) A clear inference is that the Air Force needs to be fully prepared to answer the many questions raised by Congress as it

considers a new weapon system (74). Two individuals suggested that the gaining command for the weapon system prepare a comprehensive presentation about the proposed system, to make Congress and the Air Staff aware of the need for the system (32; 104). Another individual suggested that organizations have several "what if" packages prepared on the costs and consequences of various basing or construction options, to be ready for Congressional questions (74). This technique was often used during Congressional hearings for the Peacekeeper (74).

Another individual proposed that the Air Force attempt to get early Congressional support for a new weapon system, as well as agreement on the number of systems to be deployed and the basing mode to be used (96). A related idea is to get a "one time buy off" on a weapon system, to eliminate the multiple votes needed before weapon system development can begin (41). However, these proposals will admittedly be difficult to implement, given the current political climate, and the fact that the DOD has no control over Congressional processes (41).

One proposal for better integrating both the political and military perspectives is to establish a permanent version of the Scowcroft Commission (74). The Scowcroft Commission was a panel of distinguished military and political leaders established by President Reagan in 1983 to examine the various Peacekeeper basing modes. The

commission was able to rise above the purely military or political aspects of the problem, and present a comprehensive long-range solution in its report to the President (74). Having such a commission established on a permanent basis might be a way to stabilize the acquisition process by providing a longer-term perspective of the strategic and political implications of a weapon system (74). The way the current systems acquisition process works, each new Presidential Administration or Congressional session changes a weapon system, and as a result, very few strategic systems have been developed (74). During a recent interview, the Commander of the Air Force Systems Command, General Skantze commented that

> we go through two-year Congresses, four-year Presidents, and ten-year programs. Every year we . . . revisit the budget. That creates more instability than any other single thing in the procurement process. (88)

Basing Changes. To reduce the impact of politically-related basing changes, two individuals proposed using non-base-specific construction funds (71; 105). Both the Guard and Reserve forces are currently using such funds (105). Thus, if the basing of a weapon system changes abruptly, the Guard and Reserve authorities simply notify Congress that they are transferring funds to another base (105). However, Congress has so far declined to allow

this procedure for use with Active Duty Air Force construction projects (105; 71).

The following chapter presents the major conclusions drawn from both the literature review and the interviews with authorities in systems and facilities acquisition.

VI. Conclusions and Recommendations

Chapter Overview

This chapter summarizes the conclusions that can be drawn from this study of the programming of facilities to support major new weapon systems. Based on these conclusions, recommendations for improving the existing systems and facilities acquisition processes are made. Finally, some possible areas for future research are suggested.

Conclusions

Based on the literature review and the research interviews, the following conclusions can be drawn concerning facility acquisition in support of major new weapon systems.

Conclusion No. 1. The interviews of 51 individuals in both the systems acquisition and facilities acquisition communities resulted in a listing of five factors perceived to be the most significant factors affecting military construction in support of a systems acquisition program. These factors were 1) Requirements Identification, 2) Timing, 3) Funding, 4) Communication/Coordination, and 5) Political concerns.

Conclusion No. 2. Problems associated with the timely identification of facility requirements were mentioned as being the most important factor in facility acquisition problems. Difficulties in obtaining specific facility criteria not only hindered the programming phase of facilities acquisition, but also affected the later phases of design and construction. In particular, obtaining the support equipment criteria needed for maintenance facilities seemed to create problems for individuals at all organizational levels.

Conclusion No. 3. The differences in timing between the systems acquisition and facilities acquisition cycles appear to be the primary source of problems. While the acquisition cycle for most major weapon systems is much longer than that of the Military Construction Program, the design of the weapon system may change considerably during the development cycle. The Military Construction Program is generally perceived to be too rigid to react to the changes which inevitably occur in a systems acquisition program.

When the systems acquisition cycle is short enough that the system and the facilities are being developed simultaneously, the problem becomes even more critical. Facility engineers are sometimes forced to begin design without the necessary design criteria, simply to meet the

established project submittal deadlines to ensure that a facility will be ready in time for the delivery of the system. They may then need to make changes to the facility after construction has begun, or even after construction is completed, to compensate for changes in the system. Such problems are frequently encountered with simulators and support equipment.

Even with the introduction of measures to improve program stability, there seems little chance of reducing the number of changes in the research and development programs associated with new weapon systems. Therefore, the Military Construction Program needs to be modified so that it can more effectively respond to changes in the system.

Conclusion No. 4. The most prominent funding issues were delays in funding approval and the question of who should have control of the construction funds.

Delays in the Congressional approval of construction funds are especially common in politically controversial systems, as the research in the Peacekeeper program noted. Such delays appear to be a result of the Congressional interest in the Military Construction Program. Most individuals felt that military construction funds receive much greater Congressional scrutiny than the research and development funds used for the development

of the system. Because of this Congressional interest, construction funds are base-specific--that is, they cannot simply be transferred for use at another base in the event of a change in the weapon system basing plan.

Construction funds are currently controlled by members of the facilities acquisition community, and because of the separate approval process for military construction funds, systems acquisition personnel have little influence over these construction funds. While some individuals advocated that the Program Manager be given more control over construction funds, the political implications of this proposal would make it difficult to implement. In addition, there was significant resistance to this proposal from members of the facilities acquisition community. Therefore, the results of this study support the continuation of current policy, with construction funds remaining under the control of the facilities acquisition community.

Conclusion No. 5. Problems involving communication and coordination appeared to further aggravate the problems in developing support facilities for major weapon systems. There did not appear to be a significant amount of animosity between members of the systems acquisition and facilities acquisition communities. However, the overall communication and coordination between the two communities is quite limited. For example, there are no formal

milestones established at which the two communities meet to discuss the status of a system and its impact on facilities.

It was also evident that every new weapon system considered during the research had devised various types of organizations or working groups to improve communication flow within the program. The use of such organizations as Site Activation Task Forces and facility boards was perceived to be quite effective by the majority of respondents. Based on these responses, such organizations should certainly continue to be used for any other major weapon system acquisition and deployment. However, there should be more standard organizational procedures available for use in the development and initial basing of a major new weapon system. Currently, each systems acquisition effort must devise its own organizational structure, establish communication channels, and assign responsibilities.

Conclusion No. 6. Political issues were generally viewed as a natural part of both the systems and facilities acquisition processes. Most individuals saw little chance of significant changes in political influence in the near future. The effects of political influences are especially noticeable in certain changes in the basing of a weapon

system, as noted in the Peacekeeper program and in the tactical programs.

While the DOD has no control over Congressional operations, results of the research indicate that more effective communications with Congress and better initial presentation of initial weapon system proposals may reduce the amount of Congressional influence on certain weapon system programs.

Conclusion No. 7. The Acquisition Improvement Program is well-documented in the systems acquisition literature. However, the results of the interviews indicate that the use of the program's initiatives may not be as widespread as the literature indicates. Knowledge of the program within the facilities acquisition community in particular was extremely limited. Several individuals felt that because the program was not formally established within the systems acquisition community, it was now receiving a less than enthusiastic reception in the field. A more serious concern is that because the program does not adequately address logistics and facility issues, its widespread use could actually worsen the facilities acquisition problem.

Recommendations

The following recommendations, based on the findings of this investigation, are offered for consideration in future efforts to improve the facilities acquisition process.

Long-Term Solutions. The solutions with the most potential for improving the systems facility acquisition process generally require some type of legislative changes. These solutions will be the most difficult to obtain because of their political implications. Among the more promosing legislative solutions are the following:

1. Establish a separate Military Construction Program cycle for military construction in support of systems acquisition. Ideally, this cycle would not be subject to such rigid time constraints as the current Military Construction Program. For example, the new program should accept project submissions outside the normal Military Construction Program approval cycle. Also, there should be no requirement for a project to have reached the 35 percent design stage by a given date.

2. Establish a separate funding source dedicated to military construction in support of systems acquisition. Such funding should be more flexible than current military construction funding, with a shorter approval cycle. It should also be non-base-specific, so that it could be

easily transferred to another base in case of a weapon system basing change. However, this funding source would probably need to be subject to the same Congressional review as the current Military Construction Program if its implementation is to receive any Congressional consideration.

3. Require that the weapon system and its support facilities be approved simultaneously. This proposal does not mean that Military Construction Program funds be combined with systems acquisition funds, however. It would simply require that facilities be considered very early in the systems development cycle. This proposal would also address current concerns over funding delays for facilities while the weapon system continues to be developed.

4. Adopt a two-year federal budget. The literature review noted that the Pentagon had recently announced the start of a two-year planning and budgeting process for the FY 88 program. Extending that plan to include the rest of the federal budget system could reduce the number of funding delays which have been experienced in recent years.

As noted in the previous chapter, each of these recommendations may prove controversial, and the political implications of each must be thoroughly considered before a legislative initiative is formally proposed.

Short-Term Solutions. Although legislative changes offer the most promising solutions, they may also take several years to implement. Thus, in the interest of improving the current acquisition processes, some short-term changes are proposed which could be implemented within the existing system.

1. Educate members of both the systems acquisition and facilities acquisition communities. This education would make systems acquisition individuals more conscious of facilities and the lengthy Military Construction Program process. Similarly, it would inform members of the facilities acquisition community about the key aspects of the systems acquisition process, and make them aware of special requirements associated with construction in support of systems acquisition.

2. Improve Communication and Coordination. Greater coordination between systems and facilities personnel is essential to providing timely facilities. There should be formal guidance in both systems and facility regulations relating specifically to military construction for systems acquisition. This guidance could be in the form of easily modified checklists or milestones in supplements to existing regulations or new regulations.

Also, formal guidance should be written to help set up the organizational structures needed for the initial basing of a new weapon system. This guidance would

reduce the learning curve associated with fielding any new weapon system, and would also aid in defining the responsibilities of each organization. The Air Force Systems Command might also provide a central knowledge base for systems military construction, which could be made available to all other commands.

3. Establish a permanent "Scowcroft Commission" to evaluate both the political and military implications of new weapon systems. The research indicated that political influences can have a significant effect on the acquisition of new systems. Therefore, establishing a commission to address political issues could both improve communication between Congress and the Pentagon and improve the continuity of major systems acquisition programs.

4. Use the Acquisition Improvement Program more effectively. This program has significant potential for reducing the current timing problems associated with facilities construction for weapon systems. However, the program must be publicized and enforced if it is to be of any benefit. Also, the impact on facilities needs to be more clearly addressed in the initiatives, particularly those designed to shorten the systems acquisition cycle. The Acquisition Improvement Program should also be included in facilities acquisition regulations and literature, to make the civil engineering community aware of the program's implications for facilities.

Future Research. Future research in this area could use the problem areas and solutions presented in this study to develop a survey of a larger sample of systems and facilities personnel. This survey could be used to determine whether the perceptions noted in this study are widely held throughout the systems and facility acquisition communities.

Future research could also analyze specifically how the timing of the systems acquisition and facilities acquisition cycles could be more closely linked. It could examine which aspects of each cycle are most critical to the facilities acquisition process, and which phases are the most receptive to change.

Finally, a program of educational instruction could be developed, geared to the needs of both the systems acquisition and facilities acquisition communities. The research could address the question of which form of education would be most effective in preparing individuals in systems and facilities acquisition to work with a major new weapon system.

Appendix A: Interviewees

HQ USAF/OSD Level

Danhof, Col Richard. HQ USAF/RDXP, Deputy Director for Program Integration, 7 May 1985.

DeMartino, Col Frank A. HQ USAF/LEEP, Chief of Programs Division, 6 May 1985.

Ellis, Brig Gen George. HQ USAF/LEE, Deputy Director for Engineering and Services, 8 March 1985.

Flanagan, Maj Gerald. HQ USAF/LEYY, Director, Strategic and Fighter Bomber Program, 10 May 1985.

Gorges, Lt Col Tom. HQ USAF/LEEPR, Chief of Requirements Branch, 13 May 1985.

McCabe, Col William. HQ USAF/RDQ-B1, Special Assistant for B-1B Matters, 3 May 1985.

McLendon, Maj Michael H. OSD/PAE, Program Analysis and Evaluation, 22 and 31 May 1985.

Norton, Lt Col William. HQ USAF/LEEPO, Chief of Operations and Maintenance Branch, 3 May 1985.

Owendoff, Maj James. HQ USAF/LEEPD, MCP Project Programmer, 31 October 1984.

Robey, Billy. HQ USAF/LEXP, Logistics Management Specialist, 15 May 1985.

Vogel, Lt Col Glenn. HQ USAF/RD-M, Peacekeeper Program Element Monitor (PEM), 20 May 1985.

MAJCOM Level

Ahearn, Brig Gen Joseph A. HQ USAFE/DE, DCS, Engineering and Services, 10 April 1985.

Baker, Lt Col Paul. HQ AFSC/DEPS, Chief of Acquisition Program Development Division, 26 February 1985.

Brown, Maj Douglas. HQ SAC/DEPD, Chief of Program Development Division, 26 February 1985.

Dunmire, Capt Dana. HQ SAC/LGXB, B-1B Facilities/Site Activation Officer, 10 May 1985.

Helser, Don. HQ TAC/DEPD, Project Programmer, 25 February 1985.

Hipschman, Robert. HQ SAC/DEEQ, Chief of B-1B Facilities Division, 24 April 1985.

Mundey, Jeff. HQ AFLC/DEEC, General Engineer (Peacekeeper), 4 June 1985.

Perry, Glenn. HQ TAC/DEEE, Chief of Utilities Branch, 7 June 1985.

Randolph, Lt Gen Bernard. HQ AFSC/CV, Vice Commander, Air Force Systems Command, 29 March 1985.

Rosner, Steve. HQ AFSC/DEPS, Project Programmer, 27 February 1985.

Schwartz, Col Ray. HQ SAC/DE, DCS, Engineering and Services, 8 May 1985.

Sims, Col William. HQ AFSC/DE, DCS, Engineering and Services, 15 February 1985.

Sinclair, Col Timothy A. HQ AFSC/SDB, Director of Strategic and Mobility Systems, 24 April 1985.

Torchia, Capt Lin. HQ SAC/DEPM, Peacekeeper Base Development Project Officer, 22 May 1985.

Aeronautical Systems Division Level

Andreas, Capt Ron. ASD/DES, Strategic Systems Facilities Engineer, 1 March 1985.

Baker, Ted. ASD/YWT, Simulator Facilities Engineer, 24 May 1985.

Benavides, Louis. ASD/ALX, Director of Logistics Policy and Plans, 19 April 1985.

Clark, Lt Col James. ASD/YWSB, B-1B Simulator Program Manager, 6 June 1985.

Denega, Lt Col Peter. ASD/AL, Chief of B-1B Resources Division, 23 April 1985.

Freund, Maj Rob. ASD/B1LR, Program Manager for Interim Contractor Support and Site Activation (B-1B), 17 April 1985.

Kimberly, Col Floyd V. ASD/DE, Director of Research and Development Engineering, 9 April 1985.

Lewellyn, 1Lt Teri. ASD/YWSB, B-1B Cockpit Procedures Trainer (CPT) Program Manager, 6 June 1985.

Morris, Col David L. ASD/B1L, Director of Logistics (B-1B), 19 April 1985.

Ritz, Capt Thomas. ASD/YWT (or ASD/DES), Simulator Facilities Engineer, 24 May 1985.

Rodenroth, Lt Col Ron. ASD/TASL, Deputy Program Manager for Logistics, Advanced Tactical Fighter, 15 April 1985.

Smith, Ron. ASD/DE, B-1B Facilities Engineer, 23 and 26 April 1985.

Taylor, George. ASD/DES, Chief of Systems Facilities Branch, 9 April 1985.

Whitney, Dick. ASD/YTFD, Systems Facility Engineer (F-16, ATF), 19 April 1985.

AFRCE/Air Logistics Center Level

Coudert, MSgt David. BMO/ALI, Maintenance Management Supervisor, 28 May 1985.

Rosenfelder, Arthur. BMO/ENSR, Peacekeeper Civil Engineer, 4 June 1985.

Riddle, Col George. AFRCE-BMS/DE, Peacekeeper Facilities Program Manager, 7 June 1985.

Torgerson, Lt Col Ronald. AFRCE-BMS/DEP, Chief of Programs, 7 June 1985.

Weeks, Richard. Ogden ALC/MMGXM, Supervisory Production Management Specialist, 7 June 1985.

Base Level

Ball, Floyd. Deputy Base Civil Engineer, 96 CES/DE, Dyess AFB, 13 May 1985.

Barrows, Col Gerald V. Base Civil Engineer, 96 CES/DE, Dyess AFB, 13 May 1985.

Brown, Jury. 836 CSG/DEP, Davis-Monthan AFB, Chief of Contract Planning, 26 February 1985.

Fouser, Capt John. SATAF/DE, Warren AFB, Staff Officer, HQ SAC/DE, 29 May 1985.

Najaka, Lt Col Robert S. SATAF/DE, Warren AFB, AFRCE-BMS On-Site Representative, 29 May 1985.

O'Connor, Capt Chuck. B-1B SATAF Civil Engineer, Dyess AFB, 9 May 1985.

Suhanic, Jim. 379 CES/DEEE, Wurtsmith AFB, Chief of Engineering Design, 9 May 1985.

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433

Appendix B: Interview Questions

REPLY TO ATTN OF: AFIT/LS (1Lt Larson, 57432)

SUBJECT: Request for Interview

TO:

1. I am interested in interviewing you as part of my thesis research work. As a graduate student in Engineering Management at the Air Force Institute of Technology, I am investigating the problems associated with programming facilities to support major new weapon systems. Much of my data will come from a series of interviews with people in the fields of systems acquisition and civil engineering. Because of your specialized knowledge, I would like to have an opportunity to hear your thoughts in this area. I will be contacting you in the near future to arrange a convenient time for an interview.

2. For your convenience, I have attached a list of the questions I would like to cover during the interview. Let me stress that you do not need to fill these out or return them to me; they are provided simply to give you an idea of the areas I am interested in. Naturally, you are welcome to share any additional comments and ideas you may have.

Ruth I. Larson

RUTH I. LARSON, 1Lt, USAF
Graduate Student, School of Systems and Logistics

1 Atch
Interview Questions

INTERVIEW QUESTIONS

Name/Rank Office Symbol/Position Title Phone

1. How many months have you been in your present position?

2. Please provide a brief summary of your background in the systems acquisition or civil engineering field.

3. How does your job relate to the area of systems acquisition or facilities acquisition?

---

4. Approximately how many projects have you been involved with which required either

   a. Programming facilities to support major weapon systems?

   or

   b. Working with civil engineering personnel to obtain needed facilities for major weapon systems?

5. Is your experience primarily with tactical systems, strategic systems, or both?

6. Approximately how many months have you spent working on each of these projects?

7. Among the projects you've mentioned so far, would you say there were problems involved in obtaining the necessary support facilities? If so, what sort of problems?

8. How were these problems finally resolved?

9. Has it been your experience that there are problem areas common to several weapon systems?

   a. If so, what sort of problems?

   b. Which types of systems were involved?

10. Do you feel that some weapon systems are more prone to facility acquisition problems than others? If so, which systems? What characteristics of the systems would cause this?

11. In your opinion, what is the single most important problem associated with facilities acquisition for new weapon systems? Is this the most frequent problem as well?

12. Are there particular points in the facilities or systems acquisition process at which many of the problems seem to occur? If so, which points?

13. Sometimes organizations are able to devise ways to get around problems using methods which are not spelled out in any regulations. Do you know of any such methods which have been used with some success to provide necessary support facilities for weapon systems?

14. Are you familiar with any measures that were used to provide temporary or interim facilities?

15. Were there any subsequent problems associated with obtaining permanent facilities to replace those temporary facilities?

Certain positions require a thorough knowledge of the regulations governing that field, while others require much less familiarity with the regulations. The next six questions deal with regulations in some detail. If your job is such that you are not required to be familiar with the following regulations, we'll go on to question number 22.

a. Systems Acquisition Regulations:

(1) AFLC/AFSCP 800-34: Acquisition Logistics Management

(2) AFSCP 800-21: A Guide for Program Managers: Implementing Integrated Logistics Support

(3) AFR 800-8: Integrated Logistics Support (ILS) Program

b. Civil Engineering Regulations:

AFR 86-1: Programming Civil Engineer Resources

16. Do you feel that regulations such as those listed above provide adequate guidance on facility acquisition to the person in the field?

17. What items do you feel should be changed in these regulations?

18. Are all other items satisfactory, then?

19. Do you feel these regulations set realistic time limits for the facility acquisition process?

20. Are you aware of any major changes in the regulations while you have been in the career field? If so, did such changes improve the acquisition process, in your opinion?

21 Are you aware of any recent changes in the fields of systems acquisition or facilities acquisition? If so, have these changes been reflected in the regulations?

---

22. As a member of a large organization such as the systems acquisition community, an individual often becomes quite knowledgeable about his own job, while knowing relatively little about other aspects of the acquisition process.

    With that thought in mind, I am interested in finding out how much of the "big picture" (knowledge of the overall facilities acquisition process) your job requires. Also, if you've had to learn "the big picture" how did you learn this information?

---

23. Does your job require you to work with the Planning, Programming, and Budgeting System (PPBS)? If so, how extensively?

24. If you work with PPBS, how well do you think the time constraints in PPBS tie in with those of the systems acquisition or facilities acquisition process?

To address the problems related to systems acquisition, the Office of the Secretary of Defense has come out with a series of 32 initiatives known as the Acquisition Improvement Program. Of these 32 initiatives, I am specifically interested in your thoughts on three of these initiatives: (1) Increasing the Use of Preplanned Product Improvement, (2) Improving Program Stability, and (3) Increasing Program Manager Visibility of Support Resources. In addition, I would like to hear your thoughts regarding the concept of "baselining." If your job does not require that you be familiar with these concepts, we'll go on to question 31.

25. How do you feel the facilities acquisition process would be affected by an increased use of Preplanned Product Improvement?

26. Do you feel that efforts to stabilize the acquisition process for major weapon systems will improve the facilities acquisition process as well? Why or why not?

27. To what extent is a Program Manager currently involved in the facilities acquisition process?

28. Do you feel that increasing the visibility of the support facility requirements to the Program Manager is an appropriate measurement to improve the facilities acquisition process? Why or why not?

29. Do you feel that baselining will have a positive impact on the facilities acquisition process? Why or why not?

30. In general, do you feel that these initiatives provide a useful tool to help systems managers improve the facilities acquisition process? Why or why not?

---

31. Programs are sometimes subject to influences which may come from outside regular channels. I am interested in your throughts on the effects of such influences in three areas:

    (1) At your working level

    (2) At higher levels, such as MAJCOM, HQ USAF, or OSD

    (3) At the Congressional level

32. Do you feel such influences represent a significant problem in the acquisition process? If so, why? If not, why not?

33. Can you suggest a method by which the effects of such influences could be minimized?

---

34. What initial steps would you recommend to correct the problems we've discussed today?

35. In the long run, what do you feel is the single most important corrective action which should be taken?

1Lt Ruth I. Larson
AFIT/LS, Class 85S
Wright-Patterson AFB, OH

Phone: AV 785-4437
(Local): 57432

Appendix C: Abbreviated Interview Form

INTERVIEW

1. Thesis Title: An Analysis of the Programming of Facilities to Support Deployment of Major New Weapon Systems

2. Research Objectives: My thesis will examine the problems involved in programming direct support facilities for new weapon systems. Research will focus on two major areas: (1) a review of regulations governing the systems acquisition and facilities acquisition processes, and (2) a series of interviews with personnel in the fields of both systems acquisition and civil engineering to determine their perceptions of key problem areas.

3. Questions: Based on your experience with supporting major strategic weapon systems, I am interested in your thoughts on the following questions:

(1) What do you see as the major problem areas associated with programming support facilities for major weapon systems?

(2) Of the problems you've mentioned, which one do you feel is the single most important problem?

(3) In your opinion, what initial steps should be taken to correct these problems?

(4) In the long run, what do you feel is the single most important corrective action which should be taken?

4. Point of Contact: 1Lt Ruth I. Larson
AFIT/LS, Class 85S
Wright-Patterson AFB, OH 45433-6583

Phone: AV 785-4437
AV 785-7432

Appendix D: Background Information on the Peacekeeper Missile, the B-1B, and Simulator Programs

This appendix presents background information on three systems for which research data was collected: the Peacekeeper missile, the B-1B bomber, and simulator programs.

Nearly one year after assuming the Presidency, Ronald Reagan announced a comprehensive plan to modernize the strategic missile, bomber, and submarine forces of the U.S. (38:22). Among the new initiatives were

1) Building 100 Peacekeeper missiles with initial deployment by the end of 1986

2) Building 100 B-1B bombers by 1986 (38:22)

The Peacekeeper Missile

The Peacekeeper missile is

> an advanced intercontinental ballistic missile (ICBM) currently being developed by the Air Force to provide a critical upgrade of the U.S. land-based strategic forces. (48:54)

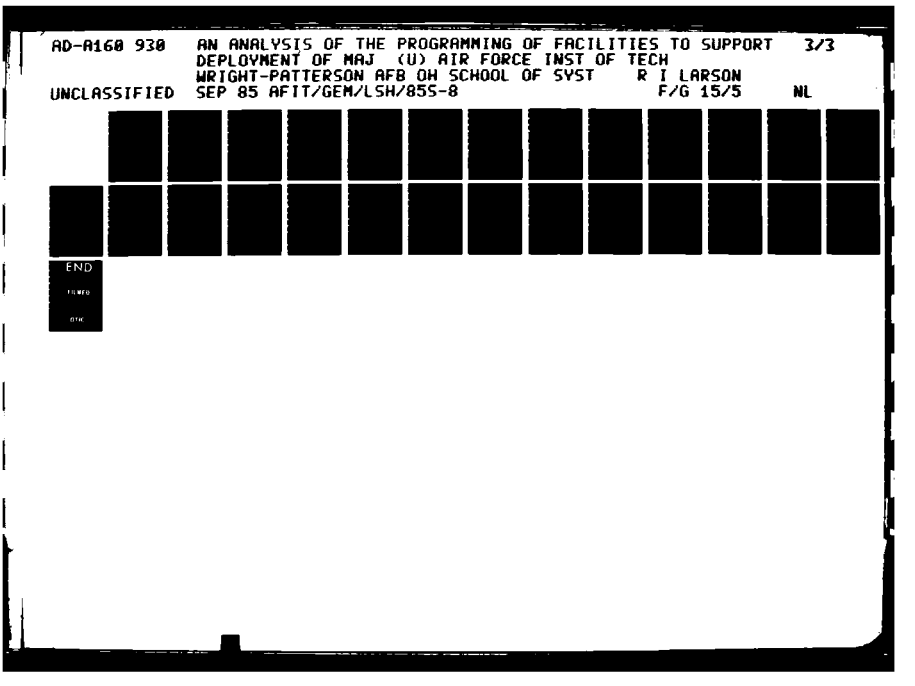
The Peacekeeper is intended to "augment and partially replace ICBM systems deployed in the 1950s and 1960s" (48:54). These existing ICBM systems include both "the 100 Minuteman missiles at F. E. Warren AFB in Cheyenne,

Wyoming, and the 52 Titan II ICBMs now being decommissioned" (80:67). The Peacekeeper is also a response to "an expansion in Soviet nuclear capabilities" (48:54).

However, the road to deployment of the Peacekeeper has not been a particularly easy one. Since its inception, the missile has continually been the focus of political debate. This debate has often threatened to delay or even cancel the deployment of the missile.

One of the most controversial aspects of the Peacekeeper has been its basing mode. The Carter Administration felt that "any new ICBM would have to incorporate 'deceptive' elements in its basing, such as an underground trench or multiple shelter system" (38:21). The basic idea behind the Carter program was to "move MX missiles from one point to another to avoid being targeted and destroyed during a surprise enemy attack" (38:21). The Carter Administration investigated a number of basing modes, and finally proposed the "Multiple Protective Shelter" concept, in which "the enemy would have to guess which of the 4600 shelters contained the 200 missiles" (38:21). The areas tentatively selected for deployment of the new missile were in Nevada and Utah (38:21). However, the public uproar that resulted from this announcement caused the Carter Administration to examine alternative basing modes (38:21).

When President Reagan took office in January 1981, he announced his intention to re-evaluate the Multiple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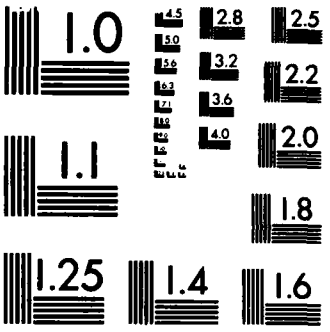

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Protective Shelter basing concept proposed by the Carter Administration. To aid in this process, Reagan established "The President's Commission on Strategic Forces," more commonly known as the "Scowcroft Commission," on 3 January 1983 (38:20; 80:62). This bipartisan commission was chaired by retired Air Force Lieutenant General Brent Scowcroft, and included such national leaders as former Secretary of Defense Harold Brown, former Secretaries of State Henry Kissinger and Alexander Haig, and former CIA Director Richard Helms (38:20).

After three months of hearings, conferences, interviews, and analysis, the Scowcroft Commission presented its report in April 1983. The report was "a strongly worded document stating that the United States was indeed falling critically behind the Soviet Union in modern strategic arms" (80:62). The report went on to suggest that the U.S. needed to "implement an ICBM modernization program to include deploying 100 Peacekeeper missiles in Minuteman silos" (80:20).

The Commission acknowledged that placing the new missiles in existing Minuteman silos would make them vulnerable to Soviet missiles, "but minimized the importance of this on the grounds that the Russians could not effectively attack U.S. missiles, submarines, and bombers at the same time" (38:21).

The Commission also recommended that

> engineering design begin on a new, small single-warhead ICBM. . . . Initiation of full scale development for the small missile could begin as early as 1987 with an initial operating capability in the early 1990s. (38:21)

The report went on to note that "deploying such a missile in more than one mode would serve stability. Hardened silos or shelters and hardened mobile launchers should be investigated now" (38:21).

Regardless of the Commission's recommendations, however, "it was still left to the President and Congress to come to agreement concerning the program the Commission recommended" (80:62). As one Commission member noted,

> what we had here was a set of far-reaching military and arms control proposals. . . . However, getting the Congress to follow the President's lead would be quite something else. That is one reason why we worked so hard to include the Congress in the progress made during the actual commission hearings. (80:62)

These initial efforts to include Congress were apparently successful, as the deployment of Peacekeeper missiles in Minuteman silos was approved by Congress in May 1983, "along with final release of the FY 1983 Peacekeeper funds" (80:62).

This basing mode decision did not end the national debate over the weapon system, however. Much of the debate now centers on the issue of vulnerability. One source noted that

> over $8-billion has already been spent on the M-X missile program, but the program still does not have

> a politically acceptable or operationally suitable basing plan. Eighty percent of the M-X force will still be vulnerable to a Soviet first strike if based in Minuteman silos as planned, and as a result, M-X has become, in many eyes, more of a "bargaining chip" than a legitimate deterrent. (12:84)

Another source notes that

> the end result of the Reagan program is that US ICBM forces will be more than ten times more vulnerable in the mid-1990s than they would have been under the Carter program. (23:56)

This source goes on to note that

> unlike densepack or mobile basing, [deploying Peacekeeper missiles in Minuteman silos] gives the USSR an obvious first strike incentive to hit the Peacekeeper, or forces the US to launch on warning. (23:56)

A study done by the Office of the Joint Chiefs of Staff shows that the Soviet SS-18 ICBM alone "could destroy not only the Peacekeeper force, but much of the ICBM and SLBM [sea-launched ballistic missile] force" (23:58).

Other problems have resulted from Congress' linkage of the Peacekeeper deployment to the development of the small ICBM recommended by the Scowcroft Commission. For example, "Congress mandated that no more than 10 Peacekeeper missiles could be deployed until a number of technical milestones were met with the small, single warhead ICBM" (80:62). Also, "no more than 40 Peacekeeper missiles could be deployed until the major elements of a mobile missile weighing less than 30,000 pounds had been tested" (80:63). Finally,

> Congress directed that deployment beyond the 40 Peacekeepers could not proceed until contractors for the

> full-scale development of the small missile system were selected, contracts awarded, and full-scale development begun. (80:63)

To reach these milestones, the Air Force has established a Small ICBM Program Office at Norton AFB, California (80:62).

In spite of these political obstacles, however, Peacekeeper deployment efforts have continued. The missiles will be deployed in "existing Minuteman silos in Wyoming and Nebraska that are supported by F. E. Warren AFB in Cheyenne, Wyoming" (40:31). "The Peacekeeper program schedule calls for initial operating capability of 10 missiles by late 1986 and full operational capability of 100 missiles by late 1989" (40:31).

The entire Peacekeeper program, including the deployment to Warren AFB, "calls for an expenditure of $16.6 billion over the 1983-90 period [constant FY 82 dollars]" (39:52). "The estimated outlay for silo construction improvement activities is $232 million over the 5-year period [1984-1988], at an annual average value of $86.4 million" (39:55), requiring inputs from 156 industries (39:54). "From FY 1984 through 1988, Peacekeeper-related work is expected to generate more than 400,000 jobs" (40:34). Thus, the development, procurement, and deployment of the Peacekeeper will have "significant economic effects throughout the nation" (39:57).

While deployment efforts continue, the actual number of missiles to be deployed is still in question,

pending resolution of some unanswered political questions. This continuing political debate over the weapon system has drawn criticism from some concerning the degree of political involvement in systems acquisition. The Office of Federal Procurement Policy has noted that

> Congress and its committees have become enmeshed at a detail level of decisionmaking and review in attempting to fulfill their responsibilities. This disrupts programs, denies flexibility to those responsible for executing programs, and obscures Congress' view of related higher order issues of national priorities and the allocation of national resources. (36:35-36)

Another source notes that

> as long as the defense budget is regarded in Washington as the only large department budget that is "controllable," then spending levels in defense will reflect economic and political objectives of the budget process, rather than being carefully crafted to meet the security of the United States. (52:34)

Finally, a third author commented that

> two consecutive Administrations are widely believed to have mangled M-X's operational features for the sake of political considerations, a weakness making it unique among major weapons. (97:89)

The B-1B Bomber

The second major weapon system initiative announced by President Reagan in 1982 was the B-1B bomber. The B-1B bomber is a "multipurpose bomber that will replace the B-52 in the strategic nuclear mission" (54:35). The aircraft incorporates some of the most sophisticated avionics technology used in a weapon system to date. For example, it has an extremely low radar cross-section--"ten times

smaller than that of the B-1A and a hundred times smaller than that of the B-52" (21:60). Also, "depending on the kinds of weapons, it can carry anywhere from 20 percent to 50 percent more of a payload than the B-52" (21:62). The bomber's avionics system is designed to accommodate future advances in both hardware and software (21:62). For instance, "the B-1B's defensive avionics system is made up of ninety-seven black boxes" (21:64) which can be quickly removed or installed as advances in avionics systems become available (21:64).

The first operational B-1B aircraft arrived at Dyess AFB, Texas, on 29 June 1985, only four years after Reagan announced the resumption of the program. However, the program has not been without its difficulties. In fact, since the B-1's inception nearly 20 years ago,

> it has been an almost classic example of stop-start instability--under the continual challenge at highest governmental and media level as to the worth of it all, for openers, and the cost-effectiveness of it in the second place. (106:24)

One major setback for the program came in 1977, when President Carter cancelled the B-1 program in favor of deploying cruise missiles (81:94). However, the four B-1A aircraft produced before program cancellation continued to be tested until, in 1981, "President Reagan requested and Congress approved, narrowly, the development and construction of 100 B-1 bombers" (106:24).

Because of the program instability experienced by the B-1, program management has needed to use a number of innovative techniques to enable the program to roll out the first production model of the B-1B on 6 September 1984, "five months ahead of schedule and within its budget of $20.5 billion" (81:94). Much of the credit for these innovations has gone to the B-1B program manager, Major General William Thurman, and his staff, "who have managed to instill a sense of urgency and pride in the four major associate contractors" (81:94-95), as well as the 5200 subcontractors and suppliers (21:64). The four associate contractors are

> Rockwell's North American Aircraft Operations for airframe and integration, Boeing Military Airplane Co. for offensive avionics, Eaton Corp.'s AIL Division for defensive avionics, and General Electric Co. for engines. (21:64)

Other innovative techniques cited by General Thurman include the following:

> --A single Management Information System (MIS), i.e., all major participants share the same data bases with each other;
>
> --A "Red Streak" communication practice which forces timely decisions before problems become crises;
>
> --The Air Force is acting as its own . . . prime contractor on the program;
>
> --Thurman reports on program status once a month directly to Air Force Secretary Vern Orr and Defense Secretary Caspar Weinberger, usually on the same day;
>
> --The R&D (research and development), production, and support, e.g. spare parts, etc., parts of the B-1B

> program are "fully concurrent," i.e. being managed in parallel rather than consecutively. (106:24)

Of course, Thurman concedes that the B-1B program was helped by having four aircraft with some 2000 flight-test hours (106:26). Thus, the B-1B program did not actually start from "ground zero" under Thurman's leadership (106:26). Thurman notes,

> I wouldn't want to say everybody should manage like the B-1, . . . But, there are some management tools I think [are] just as workable for many other systems as they have been beneficial to the B-1B program. (106:26)

For example, he specifically mentions concurrent R&D, Production, and Support Acquisition (106:26).

However, while the B-1B may indeed be ahead of schedule and within its budget, this may have been at the expense of the system's many logistics support elements. A 1984 General Accounting Office report found that

> planners have had to make premature logistics decisions because of two factors: the inadequacy of logistics data generated during research and development of the B-1B's predecessor--the B-1A--and the concurrency of B-1B development and production. Together, these factors have precluded an adequate logistics support analysis, the means through which planners normally obtain a detailed breakout of expected support requirements before production begins. (54:35)

Thus, perhaps the logistics implications of concurrent acquisition strategies need to be examined in more detail before they are used regularly in systems acquisition.

Although Air Force officials continue to point out that the B-1B is ahead of schedule and within cost, "the

B-1B has also had its share of troubles in recent months" (12:86). The fatal crash of one of the B-1A prototypes just six days before the September 1984 B-1B rollout "rekindled past arguments in the media about the need for an interim bomber like the B-1B when the so-called 'stealth' bomber is soon to follow" (12:86). Reflecting this growing "stealth versus B-1B" controversy, the Senate voted 90 to 0 in the summary of 1984 to "protect money for developing a Stealth bomber and cruise missile from any [Department of Defense] attempt to divert it elsewhere" (93:10; 12:86). Senator Sam Nunn (D-GA) has

> warned that some Air Force officials would like to buy more B-1B's than the 100 planes now projected, even though that would entail stretching out or cutting the Stealth bomber program. (93:10)

Another source notes that

> current plans call for both aircraft to be built, but aerospace experts suggest that federal deficits and greater overall scrutiny of a huge defense budget will necessitate either scalebacks in development of both programs or the outright cancellation of one bomber. (81:95)

The basing of the B-1B has also come under fire in recent months. Current Air Force plans call for the B-1B to be based at four bases in the United States, with "deployment of 32 aircraft at one base, 26 at a second base, and 16 at each of two others" (54:35). However, a 1984 General Accounting Office (GAO) study noted the following:

> According to a study conducted by a private firm, consolidation of the later two bases would not significantly increase facilities costs at the base selected. Moreover, GAO believes that elimination of one base could save up to $78 million in facility costs, $55 million in support equipment and flight-simulat[or] acquisition costs, and about $25 million per year in personnel costs. (54:35-36)

In response to this recommendation, "the Air Force expressed concern that a reduction in the number of bases would increase the vulnerability of the aircraft on the ground" (54:36). The GAO team which prepared the report then suggested "deploying some of the strategic alert aircraft at a fourth location, or a 'satellite' base" (54:36), which would then result in considerable savings over the original four-base concept.

Simulators

With the increasing complexity and cost of operating new weapon systems, simulators have become an important part of military training. The increased use of simulators in the past ten years is due to a number of factors:

> The fuel crisis in 1973 was probably the original catalyst. Suddenly, everyone--including the military--was searching for ways to conserve fuel. Simulators were one economical solution. (60:69)

> The Vietnam war graphically illustrated the results of too-little training for complex weapons systems. (69:69)

Also, the costs of providing realistic training are sometimes so great that simulators provide the only

cost-effective means by which pilots and crews can receive the training (69:69).

"The Air Force now uses simulators for everything from routine navigation procedures to realistic air-to-air combat and formation flying" (69:76). Simulators also allow students to "practice maneuvers an actual aircraft could not safely perform--like engine failure in a B-52 bomber or KC-135 tanker" (69:76).

Major simulation systems currently in the Air Force inventory include the weapon system trainers for the F-16, B-52/KC-135, and C-130 aircraft; operational flight trainers for the EF-111A and F-15; and a cockpit procedures trainer for the C-141 (69:76).

The Air Force plans to award several major simulation contracts within the next several years. These include

> the LANTIRN Part Task Trainer, the KC-135 operational trainer (refurbished and modified), and the F-111 simulator PAVE TACK modification. Planned for FY 86 is the C-17 simulator. (69:76)

Today, "many top-level Service officials are . . . actively pushing for more and better simulation systems in their Services" (69:69). Despite this high-level interest, however, simulator programs continue to face a number of obstacles. For example, some officials are critical of "how the training equipment R&D community establishes requirements for simulators, saying they still apply

standards as if buying a tank, ship, or airplane" (69:70). Instead, these officials note, "requirements should be a statement of skills needed, the behavior patterns that must be learned, and the degree of learning required" (69:70).

The major hurdle facing simulator programs is funding (69:76).

> Although the Defense Science Board in its summer 1982 study on training and training technology stated, "We believe that without supplementary investments in new training devices and methods, we simply cannot maintain the level of individual and unit performance demanded by modern high-technology warfare," the Services are still somewhat lax in funding simulation programs. Training systems are one of the first items axed in the budget cycle, and even if funded, it is usually after the weapons system has come on line. (69:74)

A related problem is that of "concurrency--building the simulator and the weapons system simultaneously" (69:74). During a November 1983 Simulator Conference, the Air Force's Deputy for Simulators noted that "a recent Air Force review found that every simulator program examined experienced deferred or late funding for various reasons" (69:74). The Deputy for Simulators went on to note that

> one contributing factor . . . is that USAF's requirements process does not consider the simulator or training system early enough to prepare credible cost estimates and justify simulator budgets. Today's complex simulators require long-lead development lead times--up to 48 months is not uncommon. As a result, if USAF waits until aircraft design and performance data are firm, the simulator will automatically be one to two years late. (69:74)

The timing of the simulator acquisition process would also seem to present a problem for the acquisition of facilities to house these simulators. The Military Construction Program requires roughly a five-year lead time, from requirements identification to construction completion. If simulator requirements are late being developed, this could easily affect the facility acquisition process, and consequently endanger the simulator program's ability to field the system on time.

Bibliography

1. Acker, David D. "The Acquisition Process: A Brief Historical Perspective," Concepts: The Journal of Defense Systems Acquisition Management, 5: 74-78 (Summer 1982).

2. Aeronautical Systems Division. "Civil Engineering Facilities Support for Aeronautical Systems." Handout for the Aeronautical Systems Division Acquisition Management Orientation Course.

3. Ahearn, Brig Gen Joseph A. HQ USAFE/DE, DCS, Engineering and Services. Personal interview. Air Force Institute of Techology (AU), Wright-Patterson AFB OH, 10 April 1985.

4. Ahearn, Col Joseph A. "If it Ain't in the POM it Ain't in the Budget," Air Force Engineering and Services Quarterly, 23: 34-37 (Summary 1982).

5. Air Force Logistics Command/Air Force Systems Command. Acquisition Logistics Management. AFLC/AFSC Pamphlet 800-34. Wright-Patterson AFB OH, Andrews AFB DC, 12 August 1981.

6. Air Force Systems Command. A Guide for Program Management (Draft). AFSC Pamphlet 800-3. Andrews AFB DC, March 1984.

7. Andreas, Capt Ronald. ASD/DES, Strategic Systems Facilities Engineer. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 1 March 1985.

8. Arcieri, Joseph D. "An Overview of Integrated Logistics Support." Unpublished article. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, July 1980.

9. Arcieri, Joseph D. and Richard E. Biedenbender. "An Updated MIL-STD-1388-1: Revitalizing Logistics Support Analysis," Defense Management Journal, 19: 7-11 (4th Quarter 1983).

10. Baker, Lt Col Paul. HQ AFSC/DEPS, Chief of Acquisition Program Development Division. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 26 February 1985.

11. Ball, Floyd. 96 CES/DE, Deputy Base Civil Engineer, Dyess AFB TX. Telephone inerview. Abilene TX, 13 May 1985.

12. Barger, Millard and others. "M-X, B-1B Uncertainties Pose Question: Is SAC an Anachronism?" Armed Forces Journal International, 122: 82-84, 86-87, 90-91, 93 (January 1985).

13. Barrows, Col Gerald V. 96 CES/DE, Base Civil Engineer, Dyess AFB TX. Telephone interview. Abilene TX, 13 May 1985.

14. Benavides, Louis. ASD/ALX, Director of Logistics Policy and Plans. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 19 April 1985.

15. Brabson, Col G. Dana (Ret). "The Acquisition Improvement Program," Program Manager, 12: 5-13 (November-December 1983).

16. -----. "Department of Defense Acquisition Improvement Program," Concepts: The Journal of Defense Acquisition Management, 4: 54-75 (Autumn 1981).

17. Brabson, Col G. Dana (Ret.) and John P. Solomond. "Readiness--Coequal," Concepts: The Journal of Defense Acquisition Management, 5: 161-189 (Summer 1982).

18. Brown, Maj Douglas. HQ SAC/DEPD, Chief of Program Development Division. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 26 February 1985.

19. Brown, Jury. 836 CSG/DEP, Chief of Contract Planning, Davis-Monthan AFB AZ. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 26 February 1985.

20. Brown, Lt Col William D. "Program Instability: Fighting Goliath," Program Manager, 12: 30-32, 61 (November-December 1983).

21. Canan, James W. "The Magnificent B-1B," Air Force Magazine, 67: 58-65 (November 1984).

22. Clark, Lt Col James. ASD/YWSB, B-1B Simulator Program Manager. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 6 June 1985.

23. Cordesman, Anthony H. "The Paradox in the FY 85 'Annual Report': Strength Without Strategy, Programs Without Purpose?" Armed Forces Journal International, 121: 54-55, 58, 60, 64, 65, 75 (March 1984).

24. Danhof, Col Richard. HQ USAF/RDXP, Deputy Director for Program Integration. Telephone interview. Washington DC, 7 May 1985.

25. Delia, Lt Col Michael D. "Initial Support Funding," Program Manager, 13, 32-35 (September-October 1984).

26. DeMartino, Col Frank A. HQ USAF/LEEP, Chief of Programs Division. Telephone interview. Washington DC, 6 May 1985.

27. Denega, Lt Col Peter. ASD/AL, Chief of B-1B Resources Division. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 23 April 1985.

28. Department of Defense. Major Systems Acquisitions. DOD Directive 5000.1. Washington: Government Printing Office, 29 March 1982.

29. Department of the Air Force. Integrated Logistics Support (ILS) Program. AFR 800-8. Washington: HQ USAF, 7 February 1978.

30. -----. The Planning, Programming, and Budgeting System (PPBS): A Primer. Washington: HQ USAF, December 1983.

31. -----. Programming Civil Engineer Resources. AFR 86-1, Vol I. Washington: HQ USAF, 7 May 1984.

32. Dunmire, Capt Dana. HQ SAC/LGXB, B-1B Facilities/Site Activation Officer. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 10 May 1985.

33. Edgar, Lt Col John D. "The New Acquisition Environment: Challenge and Opportunity," Concepts: The Journal of Defense Acquisition Management, 5: 9-15 (Summer 1982).

34. Ellis, Brig Gen George. HQ USAF/LEE, Deputy Director for Engineering and Services. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 8 March 1985.

35. Executive Office of the President. Office of Management and Budget. Circular Number A-109. "Major System Acquisitions," 5 April 1976.

36. -----. Office of Management and Budget, Office of Federal Procurement Policy. "Major System Acquisitions: A Discussion of the Application of OMB Circular No. A-109." OFPP Pamphlet No. 1, August 1976.

37. Flanagan, Maj Gerald. HQ USAF/LEYY, Director, Strategic and Fighter Bomber Program. Telephone interview. Washington DC, 10 May 1985.

38. Fornell, Brig Gen Gordon. "The Peacekeeper Missile: Centerpiece for America's New Deterrent Posture," Defense Systems Review, 1: 20-23 (August 1983).

39. Fornell, Brig Gen Gordon E. and Lt Col Glenn H. Vogel. Economic Impact of Peacekeeper in Missileman Silos," Air University Review, 36: 52-57 (November-December 1984).

40. -----. "Forecasting the Economic Impact of Major Defense Acquisitions," Defense Management Journal, 21: 28-34 (First Quarter, 1985).

41. Fouser, Capt John. SATAF/DE, Warren AFB, Staff Officer, HQ SAC/DE. Telephone interview. Cheyenne WY, 29 May 1985.

42. Freund, Maj Rob. ASD/B1LR, Program Manager for Interim Contractor Support and Site Activation (B-1B). Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 17 April 1985.

43. Gordon, Richard F. "Integrated Logistics Support (ILS) Planning," Logistics Spectrum: Journal of the Society of Logistics Engineers, 17: 22-25 (Winter 1983).

44. Gorges, Lt Col Thomas. HQ USAF/LEEPR, Chief of Requirements Branch. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 13 May 1985.

45. Hansen, Capt Kevin P. A Study of Time Constraints Related to Facilities Acquisition in Support of New Weapons Systems Initial Beddowns. MS thesis, LSSR 57-81. School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB OH, September 1981 (AD-A109 777).

46. Helser, Don. HQ TAC/DEPD, Project Programmer. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 25 February 1985.

47. Hipschman, Robert. HQ SAC/DEEQ, Chief of B-1B Facilities Division. Telephone interview. Omaha NE, 24 April 1985.

48. Judge, John F. "MX Missile Modernizes the Strategic Leg," Defense Electronics, 16: 54-56, 58, 60 (December 1984).

49. Kelley, Patricia A. "Riding the Budget Roller Coaster: Strategies for Dealing with DOD Budget Turbulence," Program Manager, 12: 41-42, 70 (November-December 1983).

50. Kimberly, Col Floyd V. ASD/DE, Director of Research and Development Engineering. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 9 April 1985.

51. Knox, Capt James S., Jr. "Tied Up in Knots Trying to do P3I?" Program Manager, 12: 33-35 (November-December 1983).

52. Kyle, Deborah M. "DoD's FY 85 Budget," Armed Forces Journal International, 121: 32-35, 53 (March 1984).

53. Lewellyn, 1Lt Teri. ASD/YWSB, B-1B Cockpit Procedures Trainer Program Manager. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 6 June 1985.

54. "Logistics Support Costs for the B-1B Aircraft Can Be Reduced," Defense Management Journal, 21: 35-36 (First Quarter 1985).

55. Marsh, Gen Robert T. "Buy One Plane and Let the Pilots Take Turns Flying It," Program Manager, 12: 2-4 (November-December 1983).

56. Martinez, Augie G. "Shortening the Acquisition Cycle," Defense Systems Management Review, 2: 60-66 (Autumn 1979).

57. McCabe, Col William. HQ USAF/RDQ-B1, Special Assistant for B-1B Matters. Telephone interview. Washington DC, 3 May 1985.

58. McCarty, Dyke. "The Acquisition of Major Systems." Handout for the Air Force Institute of Technology Professional Continuing Education Course SYS 100, Introduction to Acquisition Management, April 1984.

59. McLendon, Maj Michael H. OSD/PAE, Program Analysis and Evaluation. Telephone interviews. Washington DC, 22 and 31 May 1985.

60. Meyer, Deborah G. "Simulators: A New Ingredient in the Readiness Recipe," Armed Forces Journal International, 121: 69-70, 74-77 (January 1984).

61. Miller, Phillip H. and Jeffrey K. Reh. "The Biennial Federal Budget: A Proposal for Better Government," National Contract Management Journal, 18: 1-14 (Summer 1984).

62. Moore, Lt Col William F. "The Associate Contractor Strategy for Systems Acquisition," Defense Management Journal, 18: 35-40 (Second Quarter, 1982).

63. Morris, Col David L. ASD/B1L, Director of Logistics (B-1B). Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 19 April 1985.

64. Morrow, Lt Col Garcia E. and Jules J. Bellaschi. "A Cultural Change: Pre-Planned Product Development," Concepts: The Journal of Defense Acquisition Management, 5: 16-25 (Summary 1982).

65. Mullins, Gen James P. "Establishing Supportability as a Critical Requirements Factor," Defense Management Journal, 19: 2-64 (Fourth Quarter 1983).

66. Mundey, Jeffrey. HQ AFLC/DEEC, General Engineer (Peacekeeper). Personal interview. HQ AFLC, Wright-Patterson AFB OH, 4 June 1985.

67. Najaka, Lt Col Robert S. SATAF/DE, Warren AFB, AFRCE-BMS On-Site Representative. Telephone interview. Cheyenne WY, 29 May 1985.

68. Norton, Lt Col William. HQ USAF/LEEPO, Chief of Operations and Maintenance Branch. Telephone interview. Washington DC, 3 May 1985.

69. O'Connor, Capt Charles. B-1B SATAF Civil Engineer, Dyess AFB TX. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 9 May 1985.

70. Owendoff, Maj James. HQ USAF/LEEPD, Project Programmer. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 31 October 1984.

71. Perry, Glenn. HQ TAC/DEEE, Chief of Utilities Branch. Telephone interview. Norfolk VA, 7 June 1985.

72. Preston, Brig Gen Ray, Jr. "Baselining and Cost Caps: Putting the Lid on Weapon Systems Costs," Government Executive, 16: 28-30, 32, 34 (February 1984).

73. Randolph, Lt Gen Bernard. HQ AFSC/CV, Vice Commander, Air Force Systems Command. Telephone interview. Washington DC, 29 March 1985.

74. Riddle, Col George. AFRCE-BMS/DE, Peacekeeper Facilities Program Manager. Telephone interview. San Bernadino CA, 7 June 1985.

75. Ritz, Capt Thomas. ASD/DES, Simulator Facilities Engineer. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 24 May 1985.

76. Robey, William. HQ USAF/LEXP, Logistics Management Specialist. Telephone interview. Washington DC, 15 May 1985.

77. Rodenroth, Lt Col Ron. ASD/TASL, Deputy Program Manager for Logistics, Advanced Tactical Fighter. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 15 April 1985.

78. Rosenfelder, Arthur. BMO/ENSR, Peacekeeper Civil Engineer. Telephone interview. San Bernadino CA, 4 June 1985.

79. Rosner, Steven. HQ AFSC/DEPS, Project Programmer. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 27 February 1985.

80. Russ, Lt General Robert. "Looking Ahead at ICBM Modernization," Defense Systems Review, 2: 62-67 (April 1984).

81. Schultz, James B. "B-1B and Stealth Spark Funding and Political Debates," Defense Electronics, 12: 94-95 (December 1984).

82. Schutt, Harold J., and David D. Acker. "Program Stability: An Essential Element in Improved Acquisition," Concepts: The Journal of Defense Acquisition Management, 5: 148-160 (Summer 1982).

83. Schwartz, Col Ray. HQ SAC/DE, DCS, Engineering and Services. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 8 May 1985.

84. Sellers, Cdr Benjamin R. "Heavy Hitters Take On Cost: A Report on the DOD Acquisition Conference," Program Manager, 12: 14-19 (November-December 1983).

85. Sims, Col William R. HQ AFSC/DE, DCS, Engineering and Services. Personal interview. Air Force Institute of Technology (AU), Wright-Patterson AFB OH, 15 February 1985.

86. Sinclair, Col Timothy A. HQ AFSC/SDB, Director of Strategic and Mobility Systems. Telephone interview. Washington DC, 24 April 1985.

87. Skantze, Gen Lawrence A. "Progress, Process, and Pitfalls," Program Manager, 13: 2-8 (May-June 1984).

88. -----. Television interview on the MacNeil/Lehrer Newshour, 26 June 1985.

89. Smith, Gordon A. "A-109: A Synthesis of Concerns and Interpretations Expressed in the Literature," Program Manager, 12: 20-29 (November-December 1983).

90. Smith, Ronald. ASD/DE, B-1B Facilities Engineer. Personal interviews. Aeronautical Systems Division, Wright-Patterson AFB OH, 23 and 26 April 1985.

91. Spencer, Maj David T. "Alternatives for Shortening the Acquisition Cycle," Defense Systems Management Review, 2: 36-66 (Autumn 1979).

92. Stauch, Victor D. "Facilities Impact in Systems Acquisition: Building Noah's Ark in the 80's," Logistics Spectrum: Journal of the Society of Logistics Engineers, 17: 8-10 (Spring 1983).

93. "Stealth Vs B-1?" Armed Forces Journal International, 122: 10 (August 1984).

94. Suhanic, James. 379 CES/DEEE, Wurtsmith AFB MI, Chief of Engineering Design. Telephone interview. Wurtsmith AFB MI, 9 May 1985.

95. Taylor, George. ASD/DES, Chief of Systems Facilities Branch. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 9 April 1985.

96. Torchia, Capt Lin. HQ SAC/DEPM, Peacekeeper Base Development Project Officer. Telephone interview. Omaha NE, 22 May 1985.

97. Towell, Pat. "Chaos Reigns on Capital Hill: Congress Nickel-And-Dimes FY 85 Budget, Leaves Reagan Policy Impact," Armed Forces Journal International, 122: 87-89 (August 1984).

98. "Two-Year Budgeting Begins in FY 1988," Air Force Times, 47: 36 (10 June 1985).

99. Ulsamer, Edgar. "Priorities, Requirements, and Money," Air Force Magazine, 67: 53-58, 61 (August 1984).

100. U.S. Army Corps of Engineers. Omaha District, "Construction Management Plan: Peacekeeper in Minuteman Silos: Support Facilities, F. E. Warren AFB, Wyoming," March 1984.

101. U.S. Congress. House of Representatives. Military Construction Codification Act, Report of the Committee on Armed Services, 97th Congress, 2nd Session, 1982. Washington: Government Printing Office, 1982.

102. Vogel, Lt Col Glenn. HQ USAF/RD-M, Peacekeeper Program Element Monitor. Telephone interview. Washington DC, 20 May 1985.

103. Webster, Richard D. "Attacking Logistics Problems Through Acquisition Reform," Defense Management Journal, 18: 3-8 (Fourth Quarter, 1982).

104. Weeks, Richard. Ogden ALC/MMGXM, Supervisory Production Management Specialist. Telephone interview. Ogden UT, 7 June 1985.

105. Whitney, Richard. ASD/DE, Systems Facility Engineer. Personal interview. Aeronautical Systems Division, Wright-Patterson AFB OH, 19 April 1985.

106. "Why the B-1B is Beating the Benchmarks," Government Executive, 16: 24-29 (September 1984).

107. Wright, Major Gen Clifton D. Address to AFIT Students, Air Force Institute of Technology (AU), 25 July 1985.

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The primary purpose of this investigation was to evaluate the effectiveness of the process by which facilities are programmed to support major new weapon systems. The study used personal interviews to obtain the perceptions of fifty-one authorities in the fields of systems acquisition and facilities acquisition at the five organizational levels, from the base level to HQ USAF. Data collection was concentrated in four major areas: (1) the B-1 bomber, (2) the Peacekeeper missile, (3) Policy and Programs, and (4) Simulators.

Results of the study indicate that five areas are perceived as being major concerns: (1) timely identification of facility requirements, (2) the timing of the Military Construction Program in relation to the systems acquisition cycle, (3) funding concerns, (4) communication and coordination problems, and (5) political concerns. Some significant differences in the perception of problem areas also appear to exist between organizational levels.

The conclusions and recommendations of the study were based on both the results of the interviews and an extensive review of the current literature relating to the systems and facilities acquisition processes. These results indicate that although some corrective actions can be accomplished within the existing system, many of the problems would require legislative or organizational changes to more closely integrate the systems and facilities acquisition processes.

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