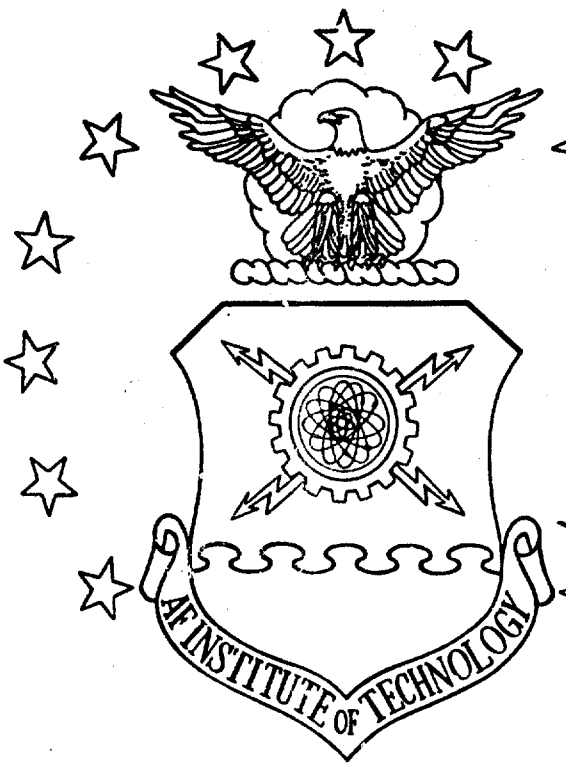

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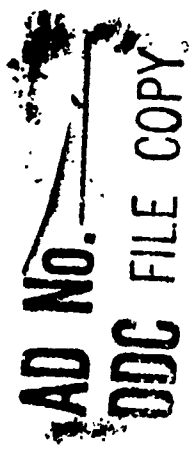

A STUDY OF THE F-4 PROGRAM MANAGEMENT RESPONSIBILITY TRANSFER (PMRT) FROM THE AIR FORCE SYSTEMS COMMAND TO THE LOGISTICS COMMAND

THESIS

AFIT/GSM/SM/77D-19 Wesley K. Darrell
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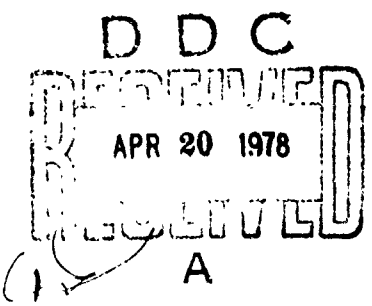

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AFIT/GSM/SM/77D-19

A STUDY OF THE F-4 PROGRAM MANAGEMENT RESPONSIBILITY TRANSFER (PMRT) FROM THE AIR FORCE SYSTEMS COMMAND TO THE LOGISTICS COMMAND

THESIS

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

by

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Graduate Systems Management

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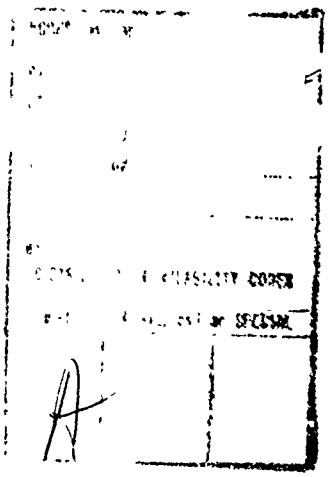

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Preface

This study was undertaken not only to fulfill a thesis requirement and hopefully provide some useful information, but also to allow the writer the opportunity to learn more about program management. The study provided the opportunity to delve into many areas of program management and resulted in a satisfying learning experience.

I selected the subject of Program Management Responsibility Transfer because it does involve the full spectrum of program management activities. Air Force Systems Command and Air Force Logistics Command interact in a complex relationship to transfer the management responsibility for a system. This transfer is a complicated process that must include all of the program management functions from both commands.

Initial discussions with people in the Fighter/Attack Systems Program Office indicated that the F-4 program transfer experienced some difficulties and that this program would provide a meaningful departure point for a study of program transfer.

In addition to providing the opportunity to become more familiar with program management, the study also provided a valuable learning experience related to the conduct of a study of this nature. The principal contributor to this learning experience was my thesis advisor, Dr. Raymond H. Klug, who deserves special words of appreciation. Dr. Klug, the Professor of Management, devoted an immeasurable amount of effort and energy to the preparation of this study. Lending considerable

management and research expertise, his guidance and support were invaluable in organizing, conducting, editing, and preparing this study. Special thanks also go to Professor T. Roger Manley who performed a vital role as second reader and provided an objective appraisal of the thesis. Finally, I would like to thank the many people in the Air Force Systems Command, the Logistics Command, and others who made this study possible through their candid sharing of information and insight. I was most favorably impressed by the knowledge and dedication of these individuals, and commend them for an enthusiastic and professional approach to a difficult area of program management.

Table of Contents

List of Figures

Abstract

The increasing costs of weapon systems have created a demand for more efficient program management. The Air Force organizational structure for acquiring and supporting weapon systems results in two commands sharing this responsibility. The Air Force Systems Command is responsible for research, development, procurement, and production. The Air Force Logistics Command is responsible for supply, maintenance, and other logistical support. Program management responsibility transfers from the Systems Command to the Logistics Command at some point in the acquisition cycle. This transition has, in the past, resulted in confusion, duplication, and fragmented responsibility. In an effort to provide for more efficient program management during program transition, the Program Management Responsibility Transfer concept was initiated in 1975. The F-4 program was the first program to transfer under this new concept.

The purpose of this study is to provide a critical analysis of the new transfer process through a study of the F-4 transfer. The primary objective is to determine if the new process has resolved difficulties encountered in past program transitions. Research methodology includes analysis of information from four sources in order to compare past transition problems with the new transfer process. Information sources include background literature, Air Force regulations, the F-4 PMRT Plan, and interview responses. Research findings are summarized and used in

a comparative analysis of the old transition process and the new transfer process. The study concludes that although the new process more clearly defines the responsibilities of the two commands, many of the past problems including fragmented responsibility, continue under the new process.

A STUDY OF THE F-4
PROGRAM MANAGEMENT RESPONSIBILITY TRANSFER (PMRT)
FROM THE AIR FORCE SYSTEMS COMMAND TO THE LOGISTICS COMMAND

I. Introduction

Increasing interests competing for scarce resources have created a demand for more efficient management in the Department of Defense (DOD). Recent years have seen a decline in real defense dollars and an increase in the number of alternatives competing for this money. Defense spending, as a percentage of gross national product, has declined from 9.3% in 1956 to 5.8% in 1976. While defense spending has been declining, the cost of new weapon systems has been increasing. The cost of all DOD weapon systems has been rising at a rate of 5.5% per year, after discounting inflation. The cost of jet fighters has been rising 9.2% per year (Ref 28:4,6). The result is keen interest in and more emphasis on efficiently managing resources throughout the DOD.

Weapon system acquisition and support, a vital part of the defense mission, is understandably receiving increased attention and pressure to reduce costs. Efforts to cut costs are being made in every phase of the life cycle of weapon systems, and program management is coming under closer scrutiny to improve efficiency while still providing adequate defense systems. New management philosophies and techniques are constantly emerging in this pursuit of efficient and effective program management.

Weapon system acquisition and support is a multi-billion dollar business. The Presidential budget, submitted to Congress in January of 1977, indicates a reversal of the trend of declining real defense dollars, and provides for real growth in the defense budget. The defense budget included total expenditures of $121.3 billion for fiscal year 1979. This represents a real growth, after accounting for inflation, of $5.7 billion over fiscal year 1978, and real growth was projected for each year through 1982 (Ref 19:12-14).

Although the defense budget now indicates growth, the high costs of acquiring and supporting weapon systems will continue to require efficient program management. The Air Force (AF) historically uses over one third of the total defense budget (40.3% in 1964 and 27.7% in 1977) (Ref 43:108). System acquisition and support costs consume a major portion of the AF budget. Budgeted costs are not classified in system acquisition and support categories, but aircraft procurement for fiscal year 1978 totalled $13 billion. This figure represents a sizeable investment, and it includes only aircraft procurement for one year. For the F-16 program, total acquisition costs are estimated to be $4.6 billion, and 15 year operation and support costs are estimated at $7.4 billion (Ref 28:9). These figures indicate the magnitude of AF acquisition and support costs, and substantiate the notion that weapon system acquisition and support will continue to play an important role in the defense mission.

Current organization of the AF for acquisition and support of weapon systems differs from that of the other services, and this difference causes unique problems in the AF. The Army Material Command and the Navy Material Command each act as single agencies for acquisition and support of systems in their respective services (Ref 22:11-12). In the AF, two separate commands usually share the responsibility for managing weapon systems in the acquisition and support areas. Other commands may have this responsibility for minor programs, as delegated by the Secretary of the AF, but the Air Force Systems Command (AFSC) and the Air Force Logistics Command (AFLC) manage most programs, and all the major programs.

AFSC is responsible for applied research, development, and production of all major weapon systems acquired by the AF. AFSC Headquarters (HQ) delegates this authority to the System Program Offices (SPO) located in three buying divisions: Electronic Systems Division, Aeronautical Systems Division, and the Space and Missile Systems Office (Ref 22:11).

AFLC is responsible for world-wide logistical support of all the major systems in the AF, upon entry into the operational inventory. This responsibility includes maintenance, repair, modification, procurement of spare parts, and operational support (Ref 22:11). Five Air Logistics Centers (ALC) work under AFLC to perform these functions.

Unique problems with respect to AF acquisition and support arise when responsibility for managing the system transfers from AFSC to AFLC. What may appear to be a simple matter of passing

management responsibility is actually a complex process requiring close coordination and cooperation from many individual areas of systems management. This transfer has, in the past, proved to be complex and confusing, and has often been a stumbling block in effectively managing a weapon system.

A study conducted in 1976, at the Air War College, concluded that the transition process was complex and that the program responsibilities were not well defined during this transition. Groves and Winkler stated, "It is evident that the system is an extremely complex and interwoven process containing multiple transfer points for the various functional areas and responsibilities. Also, one can see that the system is somewhat cumbersome and awkward, and that management responsibilities can be fragmented at various times during the production phase" (Ref 28:34).

The AF Inspector General (IG) conducted a study of the transition process in 1974. The IG reported that transition was not well defined and became a piece-meal, drawn out process. The IG concluded, "We found transition to be a cumbersome and inefficient process which needed more precise definition, positive direction, and improved management visibility " (Ref 27:4).

As a result of the IG findings, Program Management Responsibility Transfer (PMRT) was initiated, to replace the old transition process. PMRT was envisioned as a smooth, coordinated transfer of management responsibility. The intent was to clearly define when responsibility for the entire system

would transfer, thus ending the confusion, duplication, and inefficiency. Because PMRT was to include total responsibility, the process would no longer be piece-meal and drawn out. At a predetermined date, agreed to by AFLC and AFSC, total responsibility for a program would transfer to AFLC.

The AF published new directives to implement PMRT. The directives outline how PMRT should be accomplished and require that a specific PMRT Date (PMRTD) be established. AFLC and AFSC published a joint supplement to clarify PMRT at the working level. Numerous other regulations that deal with various aspects of program management have been and are being changed to reflect the PMRT concept. These regulations are examined in chapter III.

The first weapon system program to be influenced by the new PMRT concept was the F-4 program. This program basically consisted of a major system acquisition involving several different models of the F-4. The aircraft are used by the United States (US) AF, Navy, and Marines, and are sold to several foreign countries. Some models of the F-4 had already transitioned to AFLC under the old transition policies, and work was under way to transition the remainder of the F-4 program when Air Force Regulation (AFR) 800-4, Transfer of Program Management Responsibility, was published in March of 1975. Six months of intensive work followed, to prepare the program for a PMRTD of 1 October 1975. This thesis examines the F-4 transfer; the first program transfer conducted under the new PMRT concept.

To avoid confusion over terminology used in this thesis, the definitions of "transition" and "transfer" need to be clarified. Throughout the remainder of this study, "transition" is used to denote the old transition process that was in effect prior to implementation of PMRT. "Transfer" reflects the new PMRT process, with two exceptions. The old transition process included an Engineering Transfer Package (ETP) and an Updating Change-Modification Transfer Agreement (UC-MTA), and when transfer is used in the context of the ETP or the UC-MTA, the term refers to the old transition process. Whenever the terminology might be misleading, the writer has added explanatory information. The remainder of this introductory chapter states the central problem and discusses the purpose and objectives of the thesis, the scope and limitations of the research, and the research methodology followed in the study.

Statement of the Problem

Past transitions of program management responsibility from AFSC to AFLC have been protracted affairs that resulted in duplication, fragmented responsibility, and confusion in program management. PMRT was designed to definitize the transfer process and to provide more efficient program management. If duplication and split responsibility could be reduced or avoided, AFSC and AFLC would not have to perform the same tasks, and people could be released to work in other areas, thereby reducing one area of costs in systems management. The problem, addressed in this study, is whether or not the PMRT process accomplished this goal in the F-4 transfer, and to what extent PMRT can be expected to reduce divided responsibility in future transfers.

Purpose

The purpose of this thesis is to provide a critical analysis of the PMRT process through a study of the F-4 PMRT. The new PMRT process is compared to the old transition process to determine if problems associated with past transitions have been solved by implementing PMRT. Also, the PMRT process is investigated to identify any new problems arising because of the new transfer concept. Documentation and anlysis of this first transfer should provide useful insight for future transfers.

This study is not an attempt to fix blame for past or present problems. Program transition or transfer is a difficult, complex process, and problems associated with this process are identified solely for the purpose of comparing the results under PMRT with the previous transition process.

Objectives

The primary objective of this study is to try to determine if and to what extent, PMRT, as viewed through the F-4 PMRT, resolved the difficulties encountered in past transitions. A closely related objective is to determine and identify any new problems created by the PMRT concept. From these two objectives, the writer hopes to provide some indication of the effect PMRT can be expected to have on future program transfers.

A secondary objective of this study is for the writer to become more knowledgeable about AF program management. The writer has no background in program management, but is expecting

Research Methodology

The research methodology for this study can be classified in four main areas: background literature search, survey of official directives, study of the actual transfer agreements, and interviews with key personnel involved in the F-4 transfer.

The background literature search provides information to explain the situation leading to PMRT. A study of the evolution of AF acquisition and support functions shows how the present AF organization came into being, and establishes the necessity for a transfer process. A discussion of the old transition process points out problems that existed in that process. These transition problems are summarized for comparison with the PMRT process.

The information researched for the background area of the study came primarily from AF sources. The AF is the only military service that transfers program management responsibility from an acquiring command to a separate support command. The Army and the Navy manage programs in one command throughout the life of the program, and have no process similar to PMRT.

A search through the Defense Documentation Center provided no information pertaining to transition or PMRT. The Air University Abstract of Research Reports provided several studies of the transition process, and these studies are used in this thesis. Of three previous Air Force Institute of Technology theses dealing with transition or transfer, one was recent enough to address PMRT before implementation, and it

an assignment to a SPO, and this research provides the opportunity to learn more about program management. This may prove to be a benefit to readers who do not have program management experience. Terms and concepts are explained, and the writer has attempted to provide a logical, understandable description of an extremely complex process.

Scope and Limitations

This study is limited in two respects. First, the research concentrates on one program: the F-4 program. Second, only one aspect of program management is considered: PMRT.

The study is limited to the F-4 program primarily because the F-4 was the first program to transfer under the PMRT concept. A secondary reason for limiting the research to the F-4 transfer is to restrict the research to a workable scope in the available time. Considering only the F-4 program, provides a reasonable basis for study of the transfer in terms of documentation to review and key personnel to interview. Other programs are considered, particularly in the background section, but the main thrust of the study is directed to the F-4 program.

This study examines only one small phase of program management, the PMRT process. Program management over the life cycle of a weapon system encompasses many technical and managerial areas from conception to retirement, and PMRT represents only one small phase in the broader context of total program management. AFLC and AFSC must interface in many other areas, but this study is limited to the PMRT interface.

is used for background material. Articles in current periodicals, a Rand report, an AF HQ study, and the IG report that led to PMRT provide the remainder of the information for the background section.

The next phase of the research, the survey of official directives, is a study of AF directives pertaining to PMRT. The AF directives incorporate DOD guidance, and some have been supplemented by AFLC and AFSC. Most of these directives have been updated to reflect the PMRT concept. Some directives have not been revised since the publication of AFR 800-4, which implements PMRT.

The third phase of the study examines the actual PMRT agreement for the F-4 program, along with relevant letters and documents. This information is discussed to provide an idea of how the transfer proceeded and to analyze the actual PMRT Plan. The F-4 SPO was the focal point for PMRT, and documents from this SPO provide most of the information used in this phase of the study. These records represent the first PMRT for a major weapon system.

The final phase of the study consists of interviews with personnel, in both AFSC and AFLC, who were involved in the F-4 PMRT or who can provide relevant PMRT information. These people present the views of current experts on the subject of PMRT, and provide information to fill the gaps in the other information sources. Many of the people interviewed are still involved in the PMRT process, and are participating in joint AFLC/AFSC efforts to identify problems in the PMRT process.

The writer has attempted to tie these four research areas together into a logical analysis of the F-4 PMRT. To develop this analysis, problems in both the transition and transfer processes are identified and compared. The study is generally organized around the research phases. The next section of the study provides a background of transition history and identifies problems that existed in the transition process, which lead to the implementation of PMRT. Then, a survey of AF directives defines PMRT and points out the impact PMRT has on program transfer. The actual F-4 PMRT Plan is studied and compared to similar events in the old transition process. Some of the opinions of the people interviewed are included in the early chapters, but most are reported in chapter V as the opinions relate to management functions. Chapter VI integrates the research findings and provides a comparison of transition and PMRT problems. Finally, the last chapter summarizes the research effort and provides conclusions and recommendations pertaining to the PMRT process.

II. Background

This section of the study identifies problems that have been attributed to the transition process. First, a brief history of acquisition management in the AF explains some of the reasons for present AF policies and procedures in systems acquisition. This history leads to the necessity for a transition or transfer process. Next, the old transition process is analyzed through a review of several previous studies of program transition. This analysis includes some of the terminology and concepts used in program management, and necessary for an understanding of PMRT. The shortcomings identified in the transition process are summarized at the end of this chapter and provide a basis for evaluating the PMRT process.

Acquisition History

The current organization in the AF for the acquisition and support of weapon systems is the result of numerous perturbations in acquisition policy; a continuous evolution reflecting not only attempts at management improvements, but also political considerations. Bolton comments that this organization has evolved from many philosophies aimed at optimizing the answer to the question of where to divide the functions of the weapon system acquisition cycle of research, development, procurement, production, and logistic support (Ref 18:9).

The following description of AF acquisition history indicates some of the considerations that went into forming acquisition policy. The history leads to the present AF organization and policy of dividing the responsibility for acquisition and support between AFSC and AFLC. This section is a summary of a 1972 Rand report (Ref 36:1-24). Comments from other sources are referenced.

When the Army Air Corps was established in the mid-1920s, a material division was formed to perform the functions of experimental engineering, procurement, production engineering, supply, and maintenance. Project offices were established for each specific aircraft and each engine. In the 1930s, these project offices separated into two divisions: the engineering division and the production division. This basic departmentalization and resultant structure lasted throughout World War II and into the post war period. One exception to managing projects in these two divisions was the B-29 bomber, where one officer was placed in charge of both engineering and production.

Bolton notes that these two divisions, engineering and production, experienced the first transition problems. When a project completed developmental engineering and was ready to go into production, the project had to be transitioned from the engineering division to the production division (Ref 18:11). Bolton also comments that when World War I ended, acquisition emphasis shifted from production to prototyping and aerodynamic tinkering. When World War II began, the Air Corps had prototypes

and the technology to build aircraft, but lacked experience in production engineering. The emphasis quickly switched to mass production, and this emphasis continued after World War II (Ref 18:12).

Demobilization after World War II reduced defense budgets, and long term Research and Development (R&D) suffered. The AF became a separate service in 1947 and the Air Material Command (AMC) was established as the single agency for acquisition and support of systems. In 1949, the AF Scientific Advisory Board and the Air University recommended that more resources be devoted to R&D, and that an R&D organization be established independently from procurement and production. Bolton states that the reason for recommending more R&D was because these boards felt that the US needed more R&D competition with the Soviet Union. He also notes that the problem of coordinating R&D and production was not adequately addressed in any reports, and was destined to become the weak link in acquisition policy (Ref 18:14-15).

The Korean War delayed implementation of the recommendation for increased long term R&D. The war also created a demand for increased production of B-47s, and established an urgent need for improved coordination and cooperation in project management. Therefore, joint project offices, combining engineering and production, were initiated. The use of joint project offices carried over into B-52 production.

R&D finally received clear recognition when the Air Research and Development Command (ARDC) was established in 1951. AMC

retained sole procurement authority and control of most of the money for system acquisition, but the acquisition cycle was divided between two commands. ARDC was responsible for basic research and development, while AMC was responsible for procurement, production, and logistic support. The joint project offices, which were previously in AMC, now became combined offices of two commands; a project office was now made up of people from both ARDC and AMC.

At this same time, the system concept for managing weapon systems, begun in World War II, was gaining favor. After encountering problems with fitting components into the B-47, the system concept surfaced and advocated considering the entire weapon system instead of designing separate components to be fitted together. Weapon System Program Offices (WSPO) were initiated in 1954, and replaced the old joint project offices. Each major weapon system was assigned to a WSPO.

The Soviet missile threat provided the stimulus for keen interest in the US ballistic missile program. A 1953 report by the Strategic Missile Evaluation Committee concluded that the technology was available to develop a ballistic missile, but successful development would require exceptional management. The Ballistic Missile Division (BMD) was created in 1954 to provide this exceptional management.

The BMD reported to ARDC, but had direct channels to other commands and to AF HQ. A high priority was placed on the program in terms of money and support from all commands. Special review and approval channels were created for the

division in 1955, and BMD plans were sent directly to the DOD, with ARDC, AMC, and the Air Staff merely advised of BMD actions. This high degree of independence may have contributed to the success of the US missile program, but began to weaken when the agencies that were bypassed in the review and approval channels protested. By 1959, the Air Staff was again reviewing BMD financial requests.

During this same time period, several studies of the acquisition process were made, but ARDC and AMC were not receptive to the recommendations of these studies. A 1956 report recommended product oriented procedures that would focus the efforts of functional organizations along product lines. This report recommended that senior officers be placed in charge of the WSPOs, that the WSPO have direct control over program resources, and that project officers be elevated in the command structure to give them more influence in the acquisition arena. Another report advocated giving procurement authority to ARDC and putting all procurement funds in R&D appropriations. This report also recommended reorganizing R&D around the functions of research, technical development, weapon system procurement, and testing. As mentioned, these reports were given a cool reception by ARDC and AMC, and none of the recommendations were implemented.

The Soviet Sputnik launch in 1957, relative success of the US ballistic missile program, and budgetary considerations all contributed to congressional interest in the acquisition process and pressure for improvement in AF acquisition. In 1957, the Advanced Research Projects Agency in DOD assumed management of

AF advanced research programs. In 1958, a DOD reorganization centralized decisionmaking authority and created the National Aeronautics and Space Administration to handle all non-military R&D and operations in space. To counter these lost slices of responsibility, and because of increased system complexity and cost, the AF undertook another study of the acquisition process.

The commanders of AMC and ARDC and five key members of the Air Staff directed a Weapon System Management Study Group. A working group, composed of a Brigadier General and ten Colonels, did the actual work. The working group concluded that management across functional lines was necessary. They recommended eliminating the split, dual command nature of system management by combining R&D and production functions, and giving all acquisition responsibility to one command. At this point, the Rand report noted that management responsibility transition from ARDC to AMC was recognized as a serious problem. Putnam stated, "Transfer of executive management responsibility from the research and development command to the materiel command was a move universally reported as awkward and counterproductive" and that one command for the entire acquisition phase was clearly indicated (Ref 36:15).

The working group recommended sweeping organizational changes to implement their findings. They proposed that procurement and production responsibility be taken from AMC and given to ARDC, and that ARDC become an Aerospace Weapons Command, responsible for R&D, development, procurement, and production. The working group further recommended that as

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contracting procedures and production money, and the ARDC SPOs were highly dependent on AMC. This solution did not reduce the number of people working in program management, nor did it reduce the length of program review channels. The SPOs supposedly had the responsibility for programs, but their dependence on AMC, and review channels through ARDC and the Air Staff, limited the authority the SPO had to control programs.

The next study of the acquisition and support organization resulted in the organization that still exists today. In the early 1960s, under the Kennedy administration, Secretary of Defense McNamara studied the system and instituted changes aimed at improving management. First, all space R&D functions and responsibilities were assigned to the AF. Then, in March of 1961, three new organizations were created: the Office of Aerospace Research, AFSC, and AFLC.

The Office of Aerospace Research reported directly to AF headquarters and was responsible for basic research. AFSC, responsible for applied research, development, procurement, and production, was organized with three divisions to handle these responsibilities: the Aeronautical Systems Division (ASD), the Electronic Systems Division (ESD), and what is now the Space and Missile Systems Office (SAMSO). AFLC was given the responsibility for supply and maintenance.

The reorganization instituted by McNamara included the recommendations made earlier by the Weapon System Management Study Group, with the exceptions that it did not shorten

decision channels and it did not reduce and combine the two commands. This basic organization is still in operation, and the responsibilities of AFLC and AFSC remain mostly unchanged since the reorganization.

To indicate how political considerations also affect the AF acquisition and support policies, Bolton provides some further background on the reasoning behind the AF reorganization in 1961. Bolton states that after General White proposed a compromise solution to the recommendations of the Weapon System Management Study Group, General Schriever continued working on plans to get procurement and production functions moved to ARDC. The Secretary of the AF told General White that the AF could regain the space mission, which had been given to the National Aeronautics and Space Administration, if the AF could resolve acquisition management problems. General White requested proposals from senior AF officials, and General Schriever submitted the same plan proposed earlier by Schriever. By this time, some people who had worked with General Schriever in the BMD had acquired some key positions in the Kennedy administration (Deputy Secretary of Defense, Special Assistant to the President, Director of DOD R&D). Thus, General Schriever already had built in high level support for the proposal to move procurement and production functions to ARDC. Secretary McNamara agreed to this plan and the result was the AFSC, which was given procurement and production functions (Ref 18:28-30).

The final organizational change considered in this section is the creation of the Air Force Acquisition Logistics Division (AFALD) in July of 1976. AFALD was organized as a part of AFLC, and was created to assist in reducing the costs of owning and operating AF systems. AFALD was created to fill a void between the designers (AFSC), the major maintainers (AFLC), and the users (Ref 23:6).

Several studies have pointed out that the total life cycle costs of acquiring and supporting a weapon system are established early in the acquisition phase. A Boeing Company study indicates that 70% of the decisions affecting the life cycle cost of a system are locked in by the end of concept studies, and 95% of the decisions are locked in by the end of full-scale development (Ref 20:36).

Since support costs are affected very early in the life cycle, and since they represent a large portion of total life cycle costs, AFLC recognized the need for an early interface with AFSC, and AFALD was created to help provide this interface. The Deputy Chief of Staff for Acquisition Logistics stated, "In short, my main job, in concert with the Air Force Systems Command, is to see that appropriate actions are taken during the acquisition process that will reduce the cost of ownership without degrading support" (Ref 20:35-36).

One way AFALD provides early AFSC/AFLC interface is through the Deputy Program Manager for Logistics (DPML), who is assigned to work in an AFSC SPO, and who represents AFALD and AFLC in the SPO. A study from the Defense Systems Management College

describes the role the DPML plays in the SPO. The Program Manager (PM) usually delegates the responsibility to manage the Integrated Logistics Support (ILS) program to the DPML. The ILS program was created to provide effective and economical support of a system over the life cycle, and emphasizes requirements for system supportability in the early stages of system development (Ref 33:II-1-II-4).

When a program eventually transfers from AFSC to AFLC, the DPML moves to the ALC and becomes the System Manager (SM). Logistics representatives were first assigned to SPOs in 1969, and as the importance of the early AFSC/AFLC interface became more widely recognized, the number of AFLC personnel assigned to a SPO has increased. The F-15 SPO has a DPML plus 40 other people from AFLC (Ref 18:65).

This early and more thorough interface between AFSC and AFLC provides the AFLC an opportunity to participate in decisions that will significantly affect later support costs. This interface also affects program transfer from AFSC to AFLC, since AFLC becomes more involved with the program prior to transfer. The future role of AFALD is subject to experience and change but, three months after AFALD was formed, program management responsibility for acquisition of an advanced tanker/cargo aircraft was moved from ASD to AFALD (Ref 23:6). This could be speculated as a return move to the management of a total program within one command, and AFALD will be watched with interest for any indications of a major change in acquisition philosophy.

To provide a brief comparison with the evolution of AF acquisition policy, the Army and the Navy acquisition policies developed along different lines. Both the Army and the Navy ended up with a single command in charge of acquisition and support functions for weapon systems. Bolton notes that the Army Material Command was established in May of 1962, with the mission of being the single organization responsible for R&D, testing, procurement, storage, distribution, and maintenance of Army supplies and equipment. The first commander of the Army Material Command said that the reason for creating the command was to solve the problem of divided responsibility between R&D and logistics.

The Navy reviewed 30 different proposals and, in 1966, also settled on a single command. Secretary of the Navy Nitze said that the reason for one command was to place more emphasis on the logistics support and maintenance of weapon systems (Ref 18:67-68). Thus, the AF is the only military service that has continued the policy of dividing the responsibility for acquiring and supporting weapon systems between two commands.

The evolution of acquisition policy in the AF has been traced from the Army Air Corps Material Division to the present organization with two separate commands sharing the responsibiliy for acquisition and support of weapon systems. The exact point in the acquisition cycle where this responsibility should be divided has been the subject of numerous studies aimed at improving AF program management. The result is the present

organization with AFSC essentially responsible for applied research, development, procurement, and production, and AFLC responsible for supply, maintenance, and other logistical support during the operational life of the weapon system. The present organization and jurisdictional arrangements give rise to the need to transfer program responsibility from AFSC to AFLC at some point in the acquisition cycle. This program transition has created problems in the past, and the transition process, as well as some of the problems associated with transition, are discussed in the next section.

Transition

The transition process that existed prior to PMRT was a complex process involving several different transition agreements and management breakpoints. To facilitate understanding transition, this section first describes two important elements of program management: the acquisition cycle and the test and evaluation program. Next, the transition process is summarized. Finally, the problems associated with transition are discussed through a chronological description of the transition process. The intent of this section is to develop and present an explanation of the problem areas normally encountered in the transition process, for later use in a comparison with the PMRT approach.

The Acquisition Cycle. The acquisition cycle of a weapon system normally consists of five phases with three major decision points between the first four phases. While this is the normal

cycle, the cycle may vary for different programs. A program may skip phases in the cycle, be in two different phases at the same time, or have multiple decision points in any one phase.

The five phases in this cycle are defined in AFR 800-2 as follows (Ref 6:4):

1. Conceptual Phase: The initial pericd when the technical, military, and economic bases for acquisition programs are established through comprehensive studies and experimental hardware development and evaluation.

2. Validation Phase: The period when major program characteristics are refined through extensive study and analyses, hardware development, test, and evaluations. The objective of this phase is to validate the choice of alternatives and provide a basis for the decision of whether or not to go to full-scale development.

3. Full-Scale Development Phase: The period when the system/equipment and the principal items necessary for its support are designed, fabricated, tested, and evaluated. The intended output is a pre-production system which closely approximates the final product.

4. Production Phase: The period from production approval until the last system/equipment is delivered and accepted.

5. Deployment Phase: The period beginning with the user's acceptance of the first operational unit and extending until the system is phased out of the inventory.

The decisions on whether or not to proceed with each successive phase of the acquisition cycle are made by the Secretary of Defense. The Secretary is advised on these decisions by a senior group of defense officials who form the Defense Systems Acquisition Review Council (DSARC). The DSARC reviews development concept papers prepared by the DOD component that is responsible for the program. AFR 800-2 describes the development concept paper as

defining program issues, including special logistics problems, program objectives, program plans, performance parameters, areas of major risk, system alternatives, and acquisition strategy (Ref 6:3). The council reviews the concept paper and makes a recommendation to the Secretary of Defense. The review and decision prior to the validation phase is called DSARC I, prior to the full-scale development phase is DSARC II, and DSARC III is prior to production. Figure 1 illustrates the acquisition cycle and the corresponding decision points.

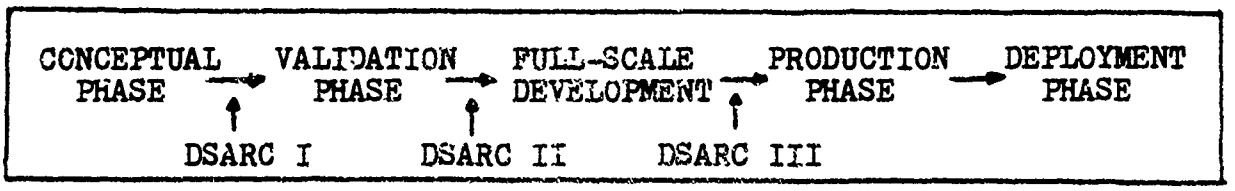

Fig. 1. The Acquisition Cycle and Major Decision Points

Test and Evaluation Program. While a system is going through the acquisition cycle, the system is continuously tested and evaluated to provide estimates of the military utility of the system. AFR 80-14 delineates the purpose of and responsibility for test and evaluation. Test and evaluation is an essential part of the system acquisition process and may occur throughout all phases of a system life cycle. The two primary types of testing, Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E) are defined as follows (Ref 5:2):

> DT&E is conducted to demonstrate that engineering design and development are complete, that design risks have been minimized, and that the system will meet engineering and operational specifications.

OT&E is conducted to estimate a prospective system's operational suitability, and to identify any operational deficiencies and need for any modifications.

The acquisition life cycle and the test and evaluation program are two important elements of program management, and have a bearing on program transfer. Transition or transfer from AFSC to AFLC must occur during the acquisition cycle, and test and evaluation provide information that is used to determine whether or not a system is ready to transition. In view of these concepts and definitions, a discussion of the transition process follows.

The Transition Process. This description of the transition process is a summary of the old process as described by Groves and Winkler (Ref 28:29-33). This process was in effect prior to the implementation of PMRT. The initial transition plan is developed following DSARC approval to enter full-scale development (DSARC II). This plan is jointly prepared by the AFSC PM and the AFLC DPML, and contains the initial target date for transition. The target date can be refined and updated at later stages in the process. Approximately one year prior to scheduled transition, the plan is formalized as a transfer agreement between AFSC and AFLC.

Transition is normally scheduled to occur at the end of the production phase, provided certain criteria for the system have been met. These criteria include: established product baseline, qualification to specifications, demonstrated performance requirements, identification, approval, and

procurement of all required updating changes, availability of adequate engineering and technical data, and data for reprocurement support.

The transition agreement is separated into functional areas involving significant aspects of the transition. These functional areas typically include: system documentation and records, configuration management, engineering, engineering data, procurement, materiel support including aerospace ground equipment, technical order data, transportation and packaging, budgeting and funding, security, and environmental assessments.

Additional packages, covering separate agreements, are attached to portions of the transition agreement, and can have effective dates that differ from the date of the basic transition agreement. Two important attachments are the Engineering Transfer Package (ETP), and the Updating Change-Modification Transfer Agreement (UC-MTA).

The ETP identifies the date for overall engineering responsibility to transition from AFSC to AFLC. This comprehensive attachment, requiring joint command approval, includes system, acquisition, operational, and data engineering. Engineering responsibility is perceived as the key to overall management responsibility, and is intimately related to other areas of the transition agreement.

The UC-MTA, closely tied to engineering responsibility, delineates responsibility for configuration management and retrofit changes. AFR 65-3 states that configuration management "identifies, controls, accounts for, and audits the functional

and physical characteristics of systems, equipment, and other designated material items developed, produced, operated and supported by DOD components" (Ref 4:1). A retrofit change is a configuration change accomplished after production delivery, and includes both modifications and updating changes. Updating changes are configuration changes identified before AFLC assumes the responsibility for configuration management, and modifications are configuration changes identified after this point.

The key to the UC-MTA is the retrofit management breakpoint (RMB). This date, again mutually agreed to by the PM and the DPML, is when management and funding responsibility for retrofit changes transitions from AFSC to AFLC. The RMB is normally established at the completion of DT&E, provided operational suitability and essential contractual planning and documentation factors have been demonstrated.

As can now be seen, the term "transition" includes several different agreements that become effective on different dates. The overall transition agreement, sometimes called management transition, includes attachments for transition of configuration management (RMB and UC-MTA) and engineering responsibility (ETP). The chronological sequence for negotiating the agreements indicates the various management breakpoints that enter into the transition process.

Typically, the RMB is established first. The UC-MTA follows, and must be signed within 90 days of the RMB. The UC-MTA becomes an attachment to the transition agreement.

The transition agreement is normally signed at approximately the same time as the UC-MTA, but this is not a requirement. The final agreement is the ETP. The date for the ETP depends on how well the system meets the crit ria for engineering transition, as determined by AFSC and AFLC. As an example of the transition process, the F-111D RMB was 1 March 1973. The transition agreement, including the UC-MTA, was signed on 1 May 1973. The engineering transition date was 1 January 1974 (Ref 28:55). This chronological sequence of agreements is followed in the next section, which discusses some of the typical problems associated with the transition process.

Problems in Transition. With the previous description of transition providing a basis, the problems that existed in the transition process are now discussed. These typical problems, taken from several different studies of transition, are summarized at the end of this section, and provide the basis for comparing the transition process with PMRT.

The problems identifi d in past studies of transition are significantly interdependent, and complex relationships exist between the problem areas. Problems in one area have an effect on problems in another area and on overall system management. This complex relationship between transition problems will become more clear as the problems are developed. The basic approach of this section is to identify problems encountered in the transition process through a discussion of the chronological sequence of the transition process.

The lack of positive direction for when to transition management responsibility provides a logical starting point for discussing transition problems. The IG study of transition found over 35 directives that affected the transition process, and ambiguous and conflicting guidance in these directives impeded orderly and timely transition (Ref 27:4). Groves and Winkler agreed with this finding, stating that numerous directives and policies have complicated the transition process by establishing additional tasks and breakpoints beyond the basic AF guidance. Groves and Winkler concluded, "The net effect is that the point at which various management transfer or transition breakponts should occur becomes very complicated and confusing" (Ref 28:29).

This lack of uniform direction, manifested in the absence of positive criteria to define when a system is ready to transition, led to differences between AFSC and AFLC in deciding on a specific date, or point, in the acquisition cycle, for transition. As the transition date was in limbo, or as it was delayed, divided responsibility, duplication, and confusion resulted. The longer the transition was protracted, the more duplication resulted.

The criteria to be met prior to transition were vaguely delineated in several AF regulations, and these criteria left much room for individual interpretation by AFSC and AFLC. Previous studies have speculated on various reasons for delaying transition, and most of these studies have

concluded that in many cases, AFSC did not want to transition early because the SPO felt that it could better manage the program than AFLC. Also, if the program transitioned, the SPO might lose personnel. Contributing to delays, AFLC often felt that the system had not adequately demonstrated reliability, and wanted to delay transition until the system was improved. A USAF study of engine acquisition and support stated that some of the reasons for delayed transfer included justifying manpower levels in AFSC, an AFLC reluctance to accept SPO generated problems, lack of ALC preparation to accept the system, and SPO reluctance to let go of the system (Ref 24:135). Whatever reasons existed for delaying transition, the fact is that guidance on when to transition allowed many different interpretations, and either command could apply an interpretation that would delay the transition.

Another problem in meeting transition criteria, and in delaying the transition, was that all the components of the system might not meet the selected criteria at the same time. Certain subsystems could experience reliability problems while others would meet all specifications. The result was that the entire system would not transition at one time. Only those components that met the criteria, according to AFSC and AFLC, were transitioned to AFLC. Components that did not meet the criteria became exceptions to transition, and remained with AFSC. The IG report states that landing gear and engines historically met the criteria earlier than other components, and were usually transitioned while other components became exceptions to transition (Ref 27:9).

When the two commands finally reached some sort of an agreement for the timing of the transition, the first formal transition usually took place with the RMB. This breakpoint involved the transition of budgeting and funding responsibility for modifications to delivered aircraft. During DT&E, AFSC prepared a list of all outstanding updating changes, with the assistance of AFLC and the user, and these changes remained the responsibility of AFSC. After the RMB, AFLC had the budgeting and funding responsibility for newly identified retrofit changes. The list of updating changes to remain with AFSC became a part of the UC-MTA, which was to be finalized within 90 days of the RMB. AFLC now had financial responsibility for retrofit changes, but AFSC still had engineering responsibility to approve these changes. Groves and Winkler pointed out that this situation caused divided responsibility because AFLC did not possess complete configuration management authority until the UC-MTA, configuration management transition (in the transition agreement), and engineering transition had all occurred (Ref 28:33). Thus, after the RMB, both AFSC and AFLC were required to approve modifications and, as Rominger noted, either command could effectively veto proposed modifications (Ref 39:7).

The AF programming and budgeting system placed added importance on the RMB. A complete discussion of this system is beyond the scope of this study, but it requires that budget proposals be submitted several years in advance. Trying to predict and budget for future modifications is

difficult, but when the problem of a program transition is included, the budgeting process takes on an added dimension of uncertainty. Since the RMB is subject to negotiation and change, AFSC and AFLC guess at the retrofit cutoff date when budget proposals are submitted. Either command could find itself in the position of having funding responsibility for retrofit changes, with no funds to support these changes. Executives of aerospace companies cited this budgeting problem as one reason they disliked working with the AF procurement system, because what was frequently budgeted for in AFSC was not covered in AFLC (Ref 18:75). Other areas of program management are also affected by the budgeting process, and delay or uncertainty in any of the transition agreements compounds budget planning difficulties.

The next agreement to be negotiated between AFSC and AFLC was the transition agreement, often referred to as the management transition. The transition agreement included the UC-MTA, which formalized the RMB. The date of the transition agreement was supposedly the date for AFLC to assume overall management responsibility but, according to Groves and Winkler, was primarily directed to status reporting and documentation (Ref 28:40).

The IG report concluded that the transition agreement gave rise to confusion as to who had the responsibility for system management, and management transition had little real meaning or understanding. The report stated, "The term 'management transition' proved to be meaningless and misleading. Additionally, each SPO which moved management responsibility to

AFLC without transferring engineering responsibility could not clearly define what responsibility it had lost. SPO personnel stated their work load had not decreased, and they continued to perform the same functions/tasks" (Ref 27:7). Groves and Winkler agreed with this finding and noted, "In reality, management transition had little significance. The retrofit management breakpoint had some meaning, but the 'key' remained for the engineering transfer" (Ref 28:60). Thus, the actual transition agreement appears to have been little more than a formality of listing the various functional areas that would eventually be the responsibility of AFLC. As long as the engineering responsibility remained with AFSC, the SPO exercised effective control over much of the system.

According to all past studies researched for this study, engineering responsibility was the most critical function in program transition. As the IG reported, the command with engineering responsibility was perceived to be the command with overall management responsibility, and, "Engineering responsibility is basic to system engineering, configuration, procurement, and technical and data management. It also supports the budgeting and funding process. Therefore, without engineering transfer the other functions cannot actually be transitioned (Ref 27:8).

Engineering pervades every aspect of system management and has an impact on all the functional areas of program responsibility. The objective of engineering for defense systems, as defined in AFR 800-3, is "The complete engineering

definition, optimization, design, integration, interface control, test, verification, production, delivery, and support of the system which will best meet the needs or deficiency identified" (Ref 7:1). The engineering management tasks, listed in the same regulation, cover a wide range of activities, and include the following: systems engineering, design engineering, specialty engineering, test engineering, production engineering, logistics engineering, civil engineering, human factors engineering, configuration management, technical data control, and technical program planning and control (Ref 7:2). After considering the broad scope of engineering management, it is easier to understand how transition of management responsibility without the accompanying engineering responsibility could lead to confusion and fragmented responsibility. But, even after engineering responsibility was transitioned to AFLC, program responsibility was still divided.

The final agreement to be negotiated under the transition process was the ETP. AFLC had already approved the RMB and the UC-MTA, and the transition agreement for the ill-defined "management responsibility" had been negotiated. The only remaining step was to transfer engineering responsibility in the ETP. However, the problem now was that exceptions to the ETP were made.

Past ETPs include numerous residual tasks, which are exceptions to engineering transition. These residual tasks remain the responsibility of AFSC. The SPO and the engineering division at the ALC negotiated the ETP. If the ALC felt that

any part of the system did not meet reliability specifications, or did not meet other transition criteria (which were subject to interpretation as previously mentioned), then that subsystem became a residual task. Residual tasks precluded complete responsibility transition, and continued to fragment responsibility between AFSC and AFLC.

Rominger noted that there were always exceptions to the engineering transition, and these exceptions were usually entire subsystems. The result of these exceptions was that management efforts were sometimes duplicated after the entire transition process had taken place. Confusion arose when the two commands still had a hand in the management function (Ref 39:40).

Even after a system had completely transitioned, and all residual tasks had been completed, AFSC could still pick up new responsibilities related to the system. As Rominger noted, AF HQ directs class V modifications and directs which command will implement these modifications. If AF HQ directs AFSC to implement the modifications, part of a system can actually transition back to AFSC, and AFSC would again be responsible for managing part of a system that had transitioned to AFLC (Ref 39:40).

Other problems associated with transition involve the entire transition process rather than fitting into the chronological sequence of transition. Two of these problems are: 1) manning for program responsibility, and 2) coordination between two commands with different management orientations.

The uncertainty of when transition would occur placed a burden on the task of effectively manning the organizations that are responsible for program management. Ideally, the SPO could begin phasing down after transition, and release personnel to begin work on other programs. Also, AFLC, and the ALC in particular, could begin building staffs as transition approached. But, with an uncertain transition, which was often delayed, this was not possible.

Rominger reports that F-111 engineers from the ALC were sent to General Dynamics for training in anticipation of F-111 A and E model transition at the end of production. By the time these systems finally transitioned, all the engineers who had been trained by General Dynamics had already been reassigned to different jobs (Ref 34:22).

In addition to specialized training in anticipation of the F-111 transition, the ALC total manning grew to its highest level long before the system transitioned. Stephenson notes that F-111 manpower levels, in the SM branch at the ALC, peaked out two years before transition. AFLC authorizations rose rapidly in 1968 and 1969, during the production run of the F-111A, and when production terminated in 1969, SM manning reached a peak. This should have put the ALC in a good position for transition, but transition did not occur until July of 1972 (Ref 41:29).

The problem in AFSC was the opposite. When the program transitioned, AFSC wanted to reassign people to other programs. Delayed transitions and residual tasks made this a difficult

planning problem for AFSC. Again using manpower figures from the report by Stephenson, the F-111 SPO held fairly constant levels until the system actually transitioned in 1972. Then, the SPO began rapid personnel reductions (Ref 41:29). It appears that if the F-111 had transitioned in 1969, at the end of the production run, the SPO could have begun phasing out two years earlier. However, this may not be a valid assessment of the ability to reduce SPO strength, for if the program had transitioned earlier, residual tasks may have still required significant manning levels in the SPO.

Another factor that contributed to problems during transition was the difference in management orientations between AFSC and AFLC. The SPO, in AFSC, had centralized authority to negotiate and approve the transition agreements. In AFLC, the DPML/SM, affected ALCs, and AFLC HQ were all actively involved in transition negotiations and approval. The SPO had difficulty interfacing with the various agencies in AFLC, and coordination problems arose.

Jurisdictional responsibilities and perspectives also contributed to coordination problems. The emphasis in AFSC was on efficient procurement and production, while AFLC emphasized follow on support. Each command approached the transition process from a particular orientation, and viewed system readiness to transition from a different perspective. The result was degraded coordination and delayed transitions.

Rominger noted that AFSC HQ was involved in transition only to the extent of formulating policies and guidelines, while AFLC HQ was actively involved, and was the final AFLC

approval authority. The SPO, with a great deal of independence and authority, represented AFSC in the transition agreement. AFSC HQ was informed of SPO actions, but allowed the SPO to exercise the authority to approve the transition. In AFLC, the SM negotiated the transition agreement, but the agreement had to be approved by the engineering division and affected item managers in each ALC, the ALC HQ, and finally AFLC HQ. (Ref 39:13, 47). Coordination problems arose because the SPO had difficulty interfacing with these offices in AFLC, and the SPO generally considered coordination through AFLC an excessive burden.

The HQ USAF study on engine acquisition agreed that the different orientations of the two commands caused problems during the transition process. The study stated that the SPO has central direction and a project orientation, while the ALCs are functionally oriented. The report went on to say that functional organization is effective when there is stability in the system, but little stability exists when an engine is introduced into the ALC. Additionally, it is difficult for a functional organization like the ALC, with the engine item manager, buried in the engine item management division, to realistically interface with a project organization like the SPO, where the engine manager and program director are quite visible (Ref 24:136). Thus, the coordination problems worked both ways. The SPO had difficulty interfacing with all affected agencies in AFLC, and any single agency in AFLC had difficulty interfacing with the SPO.

This concludes the discussion of problems associated with the transition process. Transition was a complex and interwoven process, and this discussion is by no means a complete listing of all the problems encountered in transition. Because transition was complex, understanding the process is difficult, and trying to explain the process in this short space is even more difficult. Groves and Winkler concluded their review of the transition process by stating, "A smooth, on schedule transition requires proper program planning and management by both commands. This can only be accomplished if the process is fully understood by the people involved. It is obvious after reviewing the process itself, from the number of governing regulations, and from discussions with personnel working in this area that this understanding is difficult to achieve" (Ref 28:63). While understanding transition is difficult, the previous discussion does provide a basis for comparing transition with PMRT.

To summarize the transition problems, they can be generally combined and stated as follows:

1. The transition process lacked specific direction regarding exactly when the process should occur; criteria for transition were vague and subject to individual interpretation. Numerous regulations covering transition provided ambiguous and conflicting guidance. The resultant uncertainty and delays in transition dates hindered planning for other tasks.

2. The transition process resulted in fragmented or divided responsibility between AFSC and AFLC. Some of the reasons for this divided responsibility include:

a. Several different transition agreements and management breakpoints, for different responsibilities, divided program management and led to confusion over specific responsibilities. Engineering responsibility was the last function to transition to AFLC, and resulted in AFSC retaining engineering responsibility after all other responsibilities had transitioned to AFLC.

b. Subsystems that did not meet reliability requirements became exceptions to transition, thus precluding total program transition.

c. Modifications directed to AFSC, after transition, created new AFSC responsibilities.

3. Interface difficulties and coordination problems resulted from differences in AFSC and AFLC organizational structures and management orientations.

These problem areas are, to a degree, related to each other, and resolving one problem may help to resolve others. However, the writer feels that these areas generally represent the bulk of the problems associated with transition. These problem areas are used later to compare problems encountered in the old transition process with problems in the PMRT process. This study now turns to an examination of the PMRT process. The next section of the study reviews the official guidance for PMRT.

III. Air Force Directives for PMRT

PMRT was formally initiated by AFR 800-4, Transfer of Program Management Responsibility, published on 10 March 1975. This regulation established the PMRT process to replace the old transition process. An AFSC/AFLC supplement to AFR 800-4 was published on 14 August 1975, and numerous other regulations that addressed or affected the transfer process began to be changed to reflect the new PMRT concept.

This chapter of the study provides a survey of current AF regulations which pertain to PMRT. The main purpose of this discussion is to report the provisions of the PMRT directives and to analyze these provisions. This analysis is used in comparing PMRT with the previous transition process, and begins the evaluation of PMRT.

To facilitate the discussion of official guidance, this chapter first relates the general provisions in AFR 800-4 and the joint AFSC/AFLC supplement to AFR 800-4. Next, these regulations are examined for specific criteria defining when PMRT is to take place. These criteria play an important role in providing direction for the transfer. Other regulations which affect PMRT are examined to determine if they are in consonance with AFR 800-4. Finally, the chapter is recapped in a summary evaluation of PMRT directives. This chapter presents the current official guidance for the PMRT process.

General Provisions

AFR 800-4 begins by defining some of the terms used in the PMRT concept. These terms are repeated here to provide a background for understanding the provisions in the regulations (Ref 8:1):

> Implementing Command: The command (normally AFSC) charged with responsibility for acquiring systems and equipment for the Air Force inventory.
>
> Supporting Command: The command (normally AFLC) charged with responsibility for providing logistics support and designated to assume program management responsibility from the implementing command.
>
> Program Management Responsibility (PMR): Overall responsibility for all aspects of a given program. Normally, other commands are responsible to the command having PMR for those parts of the program as specified in the Program Management Directive (PMD). (writer note: AFR 800-2 defines a PMD as a USAF HQ management directive used to provide direction to the implementing and participating commands and to satisfy documentation requirements. PMDs will be used during the entire acquisition cycle to state requirements, request studies, and to initiate, approve, change, transition, modify, or terminate programs (Ref 7:4).)
>
> Program Management Responsibility Transfer (PMRT): The transfer of program management responsibility for a system (by series), or equipment (by designation), from the implementing command to the supporting command. PMRT includes transfer of engineering responsibility.
>
> Program Management Responsibility Transfer Date (PMRTD): The calander date on which PMRT occurs.
>
> Transfer Working Group (TWG): A group established by the program manager (PM). The TWG includes representatives from the implementing, supporting, and other involved commands. The size and scope of the TWG is dependent upon the size and complexity of the program.

These definitions indicate that PMRT is an attempt to move away from the old transition policy of negotiating several separate agreements for different responsibilities. Program Management Responsibility includes overall responsibility for all aspects of a program; this is the

responsibility that transfers from AFSC to AFLC on the PMRTD. Engineering responsibility is specifically mentioned as being included in PMRT. The old transition agreements are all included in one PMRT agreement.

The joint AFSC/AFLC supplement to AFR 800-4 provides additional definitions for PMRT as follows (Ref 9:1-2):

> PMRT Plan: The document that outlines all actions, agreements, and other requirements significant to the transfer of PMR. It establishes a schedule of actions and events necessary to accomplish an orderly and timely transfer of PMR and is maintained up to date until all residual tasks are completed. The PMRT Plan:
>
> 1. Identifies responsibilities, residual and other specific tasks, and timephasing of actions for each organization involved in the PMRT process.
> 2. Provides all participating organizations with an outline of the various tasks to be accomplished with appropriate milestone schedules.
> 3. Reflects the latest program guidance and contains all currently approved changes by updating action as required.
> 4. Records objectives of PMRT in one document.
> 5. Is flexible in degree of detail based on specific program needs.
> 6. Is approved by the AFSC PM and the AFLC ALC Commander or SM/IM as appropriate.
> 7. Includes the PMRT date.
>
> Residual Task: Any action identified in section C of the PMRT Plan that the implementing command must continue through completion after the PMRT date. Residual tasks will consist of efforts which fall within the mission statement of AFSC (AFR 23-8) or are PMD directed.
>
> Engineering Data: Engineering documents such as specifications, drawings, standards, analyses, reports, or other information prepared or acquired by a design activity that defines the design performance, manufacture, test qualifications, or inspection of items and services.
>
> Military Data: That portion of engineering data represented by military specifications, standards, or military approved industry specifications or standards listed in the DOD Index of Specifications and Standards (DODISS).

Mission Design Series (MDS): A system identified by an alphanumeric designator; for example, F-111A. The mission is denoted by the first group of alpha characters; the design by the group of numerical characters; and the series by the last group of alpha characters. A difference in any of the two characters for two system designators denotes two different MDS.

Type Model Series (TMS): A subsystem or equipment identified by an alphanumeric designator; for example AN/ARN-14A and F-100-PW-100. A difference in any of the characters for two subsystems/equipment designators denotes two different TMS subsystems/equipments.

Peculiar Subsystems/Equipment: Subsystems/equipment used with only one MDS system or one TMS subsystems/equipment.

Common Subsystems/Equipment: Subsystems/equipment used with two or more MDS systems or TMS subsystems/equipment.

Nonsystem Equipment: Equipment such as certain support equipment, nonnuclear munitions, or other equipment with associated data developed and acquired independently from a system program.

Country Peculiar Systems/Equipment: Systems/equipment installed in or used with a security assistance program aircraft or other end article that differ from those installed in or used with the USAF baseline configuration.

These supplemental definitions further clarify some of the terms used in PMRT, but still leave some unresolved issues.

The definition for residual tasks refers to AFR 23-8 for the AFSC mission statement. AFR 23-8 lists a wide range of responsibi ities for AFSC and could be subject to broad interpretation (Ref 2:1-2). The mission statement in AFR 23-8, as a criterion for residual tasks, provides little definitive guidance. This question is investigated further, under the discussion of residual tasks in the F-4 PMRT Plan.

The definitions for MDS, TMS, and the different types of subsystems/equipment are important because these different items are handled differently in the PMRT process. These definitions

provide the basis for further discussion of the general provisions in the PMRT regulations.

The TWG is the group responsible for negotiating the transfer agreement. AFR 800-4 states that a TWG will be established for each program and that the group is "charged with planning and implementing a fully coordinated, orderly, timely, and efficient sequence of events leading to a successful PMRT " (Ref 8:1). The AFSC/AFLC supplement to AFR 800-4 further defines the role of the TWG. The TWG will be established immediately after full-scale development begins and will continue until all residual tasks are completed. The PM will be the chairman of the TWG prior to the PMRTD, and the TWG will function as a staff to the PM. After the PMRTD, the SM or Item Manager (IM) will chair the TWG, and the TWG becomes a staff agency to the SM/IM. Specific responsibilities of the TWG include (Ref 9:2):

1. Accomplish planning and documentation for PMRT.
2. Prepare the PMRT Plan.
3. Monitor progress of PMRT actions.
4. Track and provide management visibility of residual tasks.

The TWG, consisting of members from several commands and several agencies within these commands, has the responsibility to negotiate and implement the PMRT Plan. The PMRT Plan is complex and involves many interested agencies. A timely and efficient PMRT will depend greatly on how well the TWG can integrate diverse interests into one cohesive plan.

Guidance is provided in the regulations for the channels of coordination that the TWG must follow to get approval for

the PMRT Plan. The previous section on transition problems indicated that different command orientations created coordination problems between AFSC and AFLC. The coordination procedures outlined in AFR 800-4 and the AFSC/AFLC supplement indicate that these coordination problems will continue to be experienced in the PMRT process.

The TWG is initially responsible to coordinate among various agencies in AFSC and AFLC, but then the approval channels through the two commands differ substantially. In AFLC, the DPML/SM coordinates the plan with the ALC that will have prime responsibility for the system and with any other affected ALCs. The plan then goes to HQ AFLC for comments and approval. After HQ AFLC agrees to the plan, it is sent back to the prime ALC Commander, who signs the plan for AFLC. In AFSC, the PM continues to have approval authority for AFSC, and signs the plan after AFLC coordination and approval is completed. The PM then forwards the transfer date to AFSC HQ, and AFSC HQ in turn transmits the date to USAF HQ for inclusion in the PMD.

The coordination channels for the PMRT Plan indicate that AFLC HQ is still an active participant in the PMRT agreement. AFSC HQ, as in the past, takes a passive role of receiving information from the SPO and forwarding this information to AF HQ. This does not mean that AFSC HQ does not have input to the PMRT Plan; but, it appears that this input is more in the form of general policy guidance. If past transitions provide an indicator for PMRT coordination, AFLC HQ will

continue to take an active role in preparing the PMRT Plan while AFSC HQ will rely on the SPO to negotiate the plan.

The different ways the two commands are organized and different management orientations seem to require longer coordination channels through AFLC. The SPO is a highly centralized organization and the agencies affected by a particular PMRT Plan are usually located in one product division. On the other hand, AFLC, with a functional orientation, has more functions to go through for coordination. In addition to AFLC HQ, PMRT coordination in AFLC may involve several ALCs, which requires that the SM or IM and the ALC Commander at each ALC must approve the plan.

Longer coordination time through AFLC is not inherently bad, and may be unavoidable under present command structures. It does mean that AFLC will have to plan ahead and try to minimize any delays in order to meet PMRT deadlines. Both commands have numerous agencies affected by a PMRT Plan, and coordinating such a complex transfer is a difficult and time consuming process. Thorough planning and close cooperation are continuing requirements to avoid delaying the PMRT agreement.

Another general provision of PMRT is aimed at resolving budgeting and funding difficulties. AFR 800-4 states that each command will review program responsibilities far enough in advance to accommodate both PMRT and the Planning, Programming, and Budgeting system. Budgeting and funding for required tasks in each command are based on the PMRTD (Ref 8:1).

To clarify budgeting and funding responsibilities, the AFSC/AFLC supplement designates general responsibilities as follows (Ref 9:3):

1. AFSC will budget and fund for R&D requirements and for major system end item production requirements.
2. AFLC will budget and fund for initial and follow-on spares requirements.

While this provides some guidance for budgeting and funding, other specific requirements will have to be worked out in the transfer agreement. The ability to set a definite PMRTD early enough to facilitate the budgeting and funding cycle is the key to resolving the budgeting and funding difficulties encountered in the old transition process. This issue is examined in the section on the F-4 PMRT.

The joint supplement guidance on procurements appears to be an area where AFSC mission responsibilities are more clearly spelled out, rather than just referencing AFR 23-8. The supplement states that procurement of major systems such as aircraft, engines, and missiles will remain the responsibility of AFSC. Also, procurement of subsystems and equipment in development will not transfer. Procurement of major system modifications requiring engineering development after PMRT will normally be accomplished by AFSC. The responsibility for procurement of subsystems and components that do not require further development will transfer to AFLC (Ref 9:3). Thus, major procurements and continuing or new engineering development remain the responsibility of AFSC.

This guidance gives rise to several situations where program responsibility could be divided between AFSC and AFLC. If a program transfers, but AFSC retains management of subsystems or equipment in development, then program responsibility is divided. If a modification requiring new engineering development is needed, after PMRT, AFSC again picks up part of the responsibility for the program. These responsibilities appear to be clearly within the mission statement of AFSC and, with the present two command organization for acquiring systems, these areas of divided responsibility may be unavoidable. AFR 800-4 does direct that the responsibility for any new AFSC tasks be documented, and that a limited PMRT agreement be negotiated, establishing a date to transfer this responsibility to AFLC (Ref 8:2).

Closely related to procurement is the management of contracts. AFR 800-4 states that contractual documents will remain the responsibility of AFSC until the contracts are closed out (Ref 8:2). Exceptions to this rule are allowed, when the procuring activities of the two commands agree (Ref 9:3). Because of this arrangement, AFSC will still manage active contracts after a system transfers to AFLC, and this may create some divided responsibility.

Some background on the reasoning for retaining contract management in AFSC is provided in a letter from the F-4 SPO and from some interview responses. The letter notes that contract transfer is not considered feasable because the contracts are computerized and transfer would require

reprogramming to AFLC computers. To reprogram the contracts would interrupt program continuity (Ref 34). Interview responses indicate that AFLC has been reluctant to accept contractual management because of a lack of expertise in the procurement area. Active contracts for major programs remain with AFSC and fragment program management responsibility.

To settle the question of when to transfer subsystems/equipment that are common to more than one series of a weapon system, AFR 800-4 directs a limited PMRT agreement for this subsystem (Ref 8:2). The supplement further clarifies this situation by stating that the PMRTD for such subsystems/equipment will normally coincide with the PMRTD of the first MDS system (Ref 9:3). This should resolve the problem mentioned in the transition chapter that arose when common subsystems were not transitioned until the last MDS system transitioned to AFLC, creating divided responsibility between AFSC and AFLC for common subsystems.

Data associated with acquisition are given special consideration by the AFSC/AFLC supplement. Engineering data are included as a functional area in the transfer agreement and transfer according to the directives. Military data, however, are to be transferred through specific identification and negotiation between AFSC and AFLC. Specific criteria for military data are included in the supplement. The specification or standard for components or parts that are not anticipated to be used in new systems

will transfer. The specification or standard for components or parts used in new systems will not transfer unless it can be determined that the components or parts are at their ultimate performance and design goal. Specifications or standards covering general design requirements and critical to the ultimate performance of the system or equipment being developed will not transfer (Ref 9:4).

This guidance raises questions as to the determination of whether or not components are anticipated to be used in new systems. How will the determination of ultimate performance and design goal be made? While the writer agrees that AFSC needs these data for new systems, data that are not transferred is another area that may create divided responsibility. Additionally, the identification and negotiation between AFSC and AFLC to transfer military date could easily become a delaying factor in the transfer process.

Security assistance programs created unique problems in the old transition process, and evidentally will continue to do so under the PMRT concept. Security assistance includes grant aid programs and Foreign Military Sales (FMS) programs. Grant aid involves US assistance to foreign countries by giving US systems or equipment to the country. FMS programs involve selling systems or equipment to foreign countries (Ref 39:56). When AFLC will provide logistical support to the foreign country, the program transfers to AFLC. Some programs are not supported by AFLC, and these programs do not transfer. This situation is not addressed in AFR 800-4 nor in the AFSC/AFLC supplement, but the ASD supplement to AFR 800-4 states

that for programs where follow on support is not required, or where this support will be provided by a foreign country to contractor arrangement, the SPO should get a waiver to PMRT (Ref 10:2). This creates a situation where AFLC can accept transfer of a system intended for US use, but AFSC still manages the foreign program involving essentially the same system.

Duplication and dual responsibility can result when both commands manage the same type of a system, i.e., with AFLC managing the US program and AFSC managing the foreign program. If either command recommends a modification to the system, both commands must approve and track the configuration change, since both commands manage systems that will be affected by the modification. This problem existed under the old transition process and it appears to have continued under the PMRT concept.

The PMRT regulations indicate a purposive effort to eliminate the numerous transition agreements and breakpoints that existed under the old transition process. The supplement states, "The management breakpoint for engineering change proposals for production, retrofit, and similar changes will occur at the PMRTD. Separate updating change-modification transfer agreements and updating change packages will not be accomplished. Such agreements and supporting data will be included as an integral part of the PMRT Plan" (Ref 9:4). A single agreement, the PMRT Plan, now represents total program transfer. One date is now to be the effective date for transfer, as opposed to the

several dates found in the transition process. This provision could compress the transfer time and may result in less divided responsibility.

This single agreement may require more initial work and negotiation, since it incorporates several agreements that were negotiated under the transition process, but it appears that by combining the several transition agreements, the divided responsibility that resulted from the sequencing of transition agreements has been resolved.

The final area examined under the general regulatory provisions is the content of the actual PMRT Plan. The AFSC/AFLC supplement to AFR 800-4 specifies the format and content of the PMRT Plan as follows (Ref 8:5):

Section A--General: This section includes the purpose of the document, a brief description of the system, and definition of terms.

Section B--Specific Requirements:

1. This section provides the specific functional management requirements under which the system will be acquired by AFSC and the PMR is transferred to AFLC. It will consist of the following functional areas:

a. Program Documentation and Records
b. Engineering Data
c. Technical Orders
d. Engineering
e. Configuration Management
f. Materiel Support
g. Transportation, Packaging, and Materiels Handling.
h. Procurement
i. Budgeting and Funding
j. Security
k. Environmental Assessment and Statements
l. Test and Evaluation
m. Safety
n. Quality Assurance

2. If a functional area is not applicable to the system, the functional area and "not applicable" will be entered. If needed, areas may be added.

3. A milestone chart depicting significant actions and events leading to PMRT will be included here.

Section C--Transfer Agreement:

1. This section constitutes the PMRT Agreement. It identifies the PMRT date, residual tasks, AFSC organizations responsible and a schedule for task completion.

2. A milestone chart listing residual tasks and the schedule for their completion will be included.

While the guidance on the content of the plan is self explanatory, two points are worth further consideration. First, the complexity of the coordination, discussed previously, can now be more clearly seen. The functional areas in the plan require participation and close cooperation from numerous activities. Many of the activities are interrelated, and the integration of inputs from each activity into a cohesive document will not be an easy task. The second point is that residual tasks are listed and a schedule for task completion is required. The tasks are clearly identified in the transfer agreement and are tracked by the TWG after transfer. New emphasis given to residual tasks could help resolve the problems of unclear jurisdiction and responsibility for residual tasks.

This discussion of the general provisions of PMRT is not all inclusive, but does provide sufficient information to allow an examination of the F-4 PMRT. The following section examines the regulations for specific criteria defining when the transfer should take place.

Criteria for Transfer

The old transition process lacked specific criteria governing when a system should transition. This resulted in disagreements over selecting the transition dates and often delayed the transition process. This section of the study addresses the question of transfer timing by examining the regulations for specific criteria defining when PMRT should take place. If the regulations provide clear direction for when a system is ready to transfer, there should be little disagreement between the commands in selecting a PMRTD.

The first mention of selecting a transfer date is in AFR 800-4 under a discussion of the TWG. The regulation states, "The PMRTD will be fully coordinated by the TWG and should be selected based upon particular program needs and with full intent to effect PMRT at the earliest practicable date" (Ref 8:1). This statement indicates a desire for an early transfer, but provides no positive direction. The next paragraph notes that the PMRTD will be determined by AFSC and AFLC during the full-scale development phase, and forwarded to HQ USAF so the PMRTD can be included in the production PMD. The first specific direction appears when the regulation states, "PMRT will occur at the earliest practicable date during the production phase" (Ref 8:1). Once the date is established, it can be changed only by HQ USAF on the recommendation of the AFLC and AFSC Commanders. This provides some initial direction, and provides motivation to not change the date once it is established. This guidance may eliminate

transfer at the end of the production phase, as was often advocated under the transition process, but the guidance still leaves a wide range for selecting the transfer date.

The criteria mentioned so far is all the direction to be found in AFR 800-4. This regulation notes that the responsibility for establishing broad PMRT policy belongs to HQ USAF (Ref 8:2). The only policy set by HQ USAF for the PMRTD is that transfer will occur at the earliest practicable date in the production phase. The intent seems to be to allow the commands greater flexibility to negotiate the PMRTD. However, HQ USAF does not always agree with the determination made by AFSC and AFLC for when the transfer should occur. This issue is discussed further in the section on the F-4 PMRT, but basically involves a desire by AFSC and AFLC to postpone the PMRTD to avoid some of the residual tasks. HQ USAF did not agree with slipping the date for the F-4 PMRT and directed the transfer take place eight months earlier than recommended by AFSC and AFLC.

Disagreement over timing for the F-4 transfer is not an isolated case. Groves and Winkler point out that the same disagreement arose in the F-111D transfer (Ref 28:81). In both the F-111D and the F-4 transfers, HQ USAF disagreed with AFSC/AFLC desires to extend the transfer date, yet AF guidance on transfer allows wide latitude in selecting the PMRTD. This section now examines the guidance in the supplement to AFR 800-4 to interpret AFLC and AFSC guidance for selecting the PMRTD.

The AFSC/AFLC supplement to AFR 800-4 lists the criteria to apply in selecting a transfer date as follows (Ref 9:2):

> PMRT will be scheduled to occur when the system/equipment is operational and the workload no longer requires development engineering. The following must be fully considered in selecting the PMRTD:
> a. Product configuration baseline established.
> b. Qualification to the development/product specification accomplished.
> c. Design stability demonstrated by DT&E/OT&E.
> d. Identification and documentation of residual tasks.
> e. Essential engineering data (such as development/product specifications and exhibits along with waivers and deviations, qualification test reports, and acceptable test procedures and reports) available for accomplishing program management.
> f. Availability date for necessary reprocurement data and information to support established procurement method codes, including quality assurance data.
> g. Availability date for necessary computer software and computer software documentation and rights.
> h. Availability date of required technical order data for system/equipment operation, maintenance, and repair.

This paragraph from the supplement states that PMRT will occur when the system is operational and no longer requires development engineering. To make this determination, the list of considerations for selecting the PMRTD is provided. AFSC Pamphlet 800-3 states that entering the deployment phase signifies that a system has reached an operational ready state (Ref 15:1-1). The regulations do not provide a definition of development engineering, but it appears that a system no longer requires development engineering after DT&E is completed. By definition, the purpose of DT&E is to demonstrate that engineering design and development are complete and that the system will meet engineering and operational specifications (Ref 5:2). Although DT&E may continue throughout the acquisition life cycle, it is usually completed by the time the user receives

delivery of the first production item (Ref 28:85). Thus, a system usually becomes operational and no longer requires development engineering at about the same time. If this interpretation of an operational system and the end of developmental engineering is correct, the AFSC/AFLC guidance would seem to provide a fairly definite point for for transfer. However, the lack of a specific definition of "operationally ready" and "development engineering", and the additional considerations for selecting the PMRTD still allow individual interpretation of the regulations.

AF guidance directs a transfer as early as practicable in the production phase. AFSC/AFLC guidance directs transfer when the system is operational and no longer requires development engineering. This general guidance still allows flexibility in negotiating the PMRTD.

If the two commands agree on when the criteria for transfer have been met, and if AF HQ also agrees on the established date, there should be fewer problems in planning for the tasks surrounding PMRT. However, is there is disagreement on the criteria for transfer, or on how well a system meets the criteria, the old problem of a protracted transfer and prolonged responsibility fragmentation could result.

Groves and Winkler contend that to avoid disagreement and misinterpretation of guidance on when transfer should take place, PMRT should be based on a definable event rather than on broad criteria. Groves and Winkler recommend the date of delivery of the first production aircraft to the user as the logical point for PMRT (Ref 28:96). If a specific event or

more definable point is used, the flexibility in selecting a transfer date would be lost. This flexibility may be necessary to allow for differing programs with differing problems. Thus, there may be some tradeoff between a specifically defined transfer date and the flexibility to manage different programs.

This concludes the discussion of AFR 800-4 and the supplements to AFR 800-4, which deal directly with the PMRT process. The following section examines other regulations which indirectly address PMRT.

Other Directives

Under the old transition process, different directives provided the transition guidance for different functional areas, and resulted in having several transition packages and dates. Also, some of the transition regulations provided conflicting guidance, adding confusion and disagreement to an already complex process. This section of the study examines some of the regulations which indirectly affect the PMRT process, to determine if these additional regulations are in consonance with AFR 800-4 and the supplements. The publication dates are included so that these other regulations can be compared to the 10 March 1975 publication date of AFR 800-4.

AFR 23-2, Air Force Logistics Command (AFLC), 30 May 1974, and AFR 23-8, Air Force Systems Command (AFSC), 31 October 1975, describe the missions and responsibilities of the two commands. AFR 23-2 notes that AFLC is responsible for system engineering after engineering responsibility is transferred to AFLC (Ref 1:9).

This seems to be aimed at the old Engineering Transfer Package, but does not conflict with AFR 800-4. AFR 23-8 does not specifically mention responsibility transfer, but states that AFSC manages acquisition programs according to the AFR 800 series directives (Ref 2:1), which is in consonance with AFR 800-4.

AFR 57-4, Retrofit Configuration Changes, 26 January 1972, does conflict with AFR 800-4. This regulation still directs that a Retrofit Management Breakpoint be established, followed by an Updating Change-Modification Transfer Agreement (Ref 3:34). AFR 800-4 eliminated the RMB and the UC-MTA by including them in the PMRT Plan. This conflicting guidance is currently ignored by the commands in preparing PMRT Plans, and the commands are awaiting revision to AFR 57-4.

AFR 65-3, Configuration Management, 1 July 1974, mentions transition in Appendix F, which was published on 1 September 1974. AFSC and AFLC are to determine when to transition responsibility for configuration management (Ref 4:F-1). While the term "transition" is used, and may be associated with the old transition process, the actual guidance does not conflict with AFR 800-4.

AFR 800-2, Program Management, 16 March 1972, states that program management responsibilities will normally be transitioned from the implementing command to the designated logistics organization at the completion of the production phase or by mutual agreement at a more logical point in the life cycle (Ref 6:1). The reference to transition "at the completion of the production phase" was the general guidance for the

old transition process, and appears to conflict with AFR 800-4 guidance to transfer responsibility "at the earliest practicable date in the production phase". However, the statement that transition can be set at a more logical point in the life cycle allows the guidance in AFR 800-4 to take precedence, and resolves the question of conflicting guidance. AFR 800-2 was partially revised on 30 April 1975, but the new changes do not address program transfer.

AFR 800-3, Engineering for Defense Systems, 17 June 1977, has been changed to reflect the PMRT concept. Previous direction for an Engineering Transfer Package has been deleted, and AFR 800-3 refers to AFR 800-4 for guidance on engineering responsibility transfer.

AFR 800-8, Integrated Logistics Support (ILS) Program for Systems and Equipment, 27 July 1972, defines the role of the DPML and notes that on major programs, the DPML and the SM are the same person (Ref 11:1). The AFSC/AFLC supplement to AFR 800-8, published on 24 November 1975, further clarifies the role of the DPML/SM by stating that the DPML will normally go to the ALC and assume the duties of the SM following PMRT (Ref 12:1). This supplemental guidance has been changed to reflect the PMRT concept.

AFR 800-12, Acquisition of Support Equipment, 20 May 1974, conflicts with PMRT regulations over procurement of support equipment. AFR 800-12 states that budgeting, funding, and procurement of support equipment requiring new development effort are the responsibilities of the command having engineering

and management responsibility, unless otherwise directed by PMD (Ref 13:2). This guidance reflects the old transition policy of transitioning engineering and management responsibility in separate agreements. AFR 800-12 guidance on budgeting and funding for support equipment agrees with PMRT guidance, but the statement that procurement of support equipment requiring new development is the responsibility of the command with engineering and management responsibility conflicts with PMRT directives. AFR 800-4 states that budgeting and funding is the responsibility of the command with program management responsibility, which agrees with AFR 800-12 (Ref 8:2). However, the AFSC/AFLC supplement states that procurement of support equipment in development will remain an AFSC responsibility after PMRT (Ref 9:3). Under the guidance in AFR 800-12, procurement of support equipment requiring development would be an AFLC responsibility after PMRT. AFR 800-4 states that this responsibility will remain with AFSC. This conflicting guidance is unresolved at this time, however it appears that new development will remain an AFSC responsibility, and the guidance in AFR 800-4 is followed in actual practice.

The final regulation discussed in this section does not directly involve program transfer from AFSC to AFLC, but is concerned with system or equipment turnover to the operating command. AFR 800-19, System or Equipment Turnover, 27 May 1975, says that turnover is that point in time when the operating command formally accepts responsibility and accountability

from the implementing command for operating and maintaining a system. A turnover working group is formed from all concerned agencies, and this group negotiates the turnover agreement. This regulation states that turnover should precede PMRT (Ref 14:1). This is an example of how PMRT can affect other functions in program management. Negotiating the turnover date may be affected by negotiations for the transfer date.

This concludes the discussion of regulations that indirectly affect the PMRT process. The following section provides a summary evaluation of the regulatory guidance for the PMRT process.

Summary Evaluation of Regulations

The major change provided by PMRT is that a single transfer agreement and one effective date now cover all management responsibilities. This single agreement could eliminate much of the confusion and divided responsibility that resulted from the separate agreements negotiated under the old transition process. A more clear definition of responsibility is provided by the single agreement.

The PMRTD provides a definite breakpoint for program responsibility. This date, which is established early and is difficult to change, could facilitate planning for other tasks.

Emphasis on documenting and tracking residual tasks may also result in a more clear definition of program responsibility. The PMRT agreement lists all residual tasks and

the TWG has the responsibility to track these tasks to completion. At any point after transfer, the responsibility for any aspect of program management should be clearly spelled out.

Common subsystems, which remained with AFSC until the last MDS aircraft under the old transition policy, now transfer with the first MDS aircraft. This procedure may reduce some of the divided responsibility that resulted when each command had a hand in managing common subsytems.

Some budgeting and funding procedures are spelled out, but many procedures will require negotiation in the PMRT Plan. The budgeting and funding process may be enhanced by the better definition of program responsibility, which results from the single transfer agreement and single date. Budgeting and funding success depends on a transfer date that can be established early and is not subject to change, which is the intent of PMRT.

Despite these probable advantages of the PMRT process, PMRT does not appear to have resolved all of the problems encountered in the old transition process. Problems of divided responsibility, coordination difficulties, and controversy over when transfer should occur appear to continue under the PMRT concept.

Divided responsibility continues to result from residual tasks. Residual tasks are defined as AFSC mission responsibilities, and result in tasks that do not transfer to AFLC. The mission responsibilities of AFSC allow wide

latitude in determining residual tasks. Some of the residual tasks mentioned in the PMRT regulations include:

> Procurement of major systems and subsystems/equipment in development.
>
> Management of active contracts.
>
> Management of military data for systems requiring development.
>
> FMS programs that do not require AFLC support.

The result of these tasks is that some program responsibility will remain with AFSC after program transfer to AFLC, and divided program responsibility will continue.

Coordination problems encountered in the transition process appear to continue into PMRT. The TWG initially coordinates the transfer plan, but approval channels through AFSC and AFLC differ. The SPO is still the approval authority in AFSC, but in AFLC a number of agencies, including each affected ALC and AFLC HQ, approve the PMRT Plan. Coordination problems caused by different command orientations appear to continue into the PMRT process.

PMRT does not provide specific guidance for when transfer should occur. AF HQ direction for transfer is as early as practicable in the production phase. AFSC/AFLC direction states that transfer should occur when the system is operational and no longer requires development engineering. The resultant criteria are still vague and leave much room for individual interpretation. The selection of a transfer date was a controversial issue in past transitions and in the F-4/F-111D transfers, and this controversy may continue in future transfers.

Some regulations that indirectly deal with PMRT have been updated to reflect the PMRT concept. Of the regulations that have not been updated, most are general enough to avoid conflicting with PMRT regulations. Two regulations still conflict with PMRT directives: AFR 57-4 directs an RMB and a UC-MTA, which conflicts with PMRT guidance to include these agreements in the PMRT plan; AFR 800-12 states that support equipment requiring development is the responsibility of the command with engineering and management responsibility, but PMRT guidance directs that AFSC retain responsibility for support equipment requiring development.

In general, PMRT procedures more clearly define and track program responsibility, and seem to advocate a transfer earlier in the production phase. However, PMRT policies still allow numerous areas of divided responsibility. Criteria defining when transfer should take place are still vague and leave room for interpretation and controversy.

The following chapter illustrates how these regulations were applied through an examination of the F-4 program transfer.

IV. Analysis of the F-4 PMRT

This section of the study examines the F-4 PMRT. The F-4 program provided a significant trial case for the new PMRT concept. Past problems with the transition process were generally recognized, and the F-4 program became a subject of interest to see how PMRT would work. Proponents of PMRT were anxious to see the concept practically applied to a weapon system transfer.

The F-4C, RF-4C, and F-4D had already progressed through the transition process and transition planning for the remainder of the program was under way. Then PMRT was initiated, and the efforts to transition the program were redirected to comply with the new PMRT procedures. The F-4 program was the first system to which the new transfer process was applied. Because part of the program had transitioned, the F-4 program is not a pure example of PMRT. That portion of the program which transferred does provide the first direct application of PMRT and is used in this study for examining the PMRT process. Analysis of the F-4 transfer thus provides initial insight into how PMRT works in practice. The F-4 example is also useful in evaluating some of the reasoning underlying PMRT, and does provide some indication of the impact PMRT may have on future transfers.

This chapter of the study is divided into two sections. The first section describes the F-4 transition that took place prior to PMRT implementation. The second section examines

the actual F-4 PMRT Plan. The PMRT Plan is further subdivided into general provisions, specific requirements, and transfer agreements.

F-4 Transition Prior to PMRT

The first models of the F-4 were acquired by the Navy. Initial AF aircraft were procured by the Navy, but the AF eventually began a procurement program. AF acquisition has continued through several different models of the aircraft, including fighter and reconnaissance models. AF acquisition also includes aircraft for FMS programs. The old transition process was in use during much of the AF acquisition, and the F-4C, RF-4C, and F-4D models transitioned through the old process.

Navy F-4 airframe procurement began in January of 1962 and continued until September of 1972. The Navy/AF interface was accomplished by the F-4 SPO, which initially acted as an arm of the Naval Air Systems Command. The F-4 SPO gradually developed and took over F-4 procurement in October of 1972 (Ref 35:58; Ref 40).

The F-4 models that were transitioned to AFLC under the old process had transition agreements and Engineering Transfer Packages dated as follows (Ref 35:1):

MDS	Transition Agreement	ETP
F-4C	2 August 1965	1 May 1966
F-4D	1 July 1969	15 August 1969
RF-4C	14 February 1974	31 December 1973

The ETP for the RF-4C is a reversal of the usual sequence of transition agreements, but was not in violation of any of the various transition regulations. That the ETP could either precede or follow the transition agreement further emphasizes how program responsibility could be divided during the transition process.

The transition policy for common subsystems and equipment dictated delaying transition of these items until all MDS aircraft that used the common items were transitioned to AFLC. The F-4E, and other F-4 models for FMS programs, had many subsystems/equipment that were common to earlier F-4 models. Thus, many items did not transition with the early models.

The F-4E, in procurement since 1966, was an outgrowth of the F-4D. The major differences were higher thrust engines, an internal cannon, and an improved radar. The PMRT Plan states that since the F-4E was basically an off the shelf F-4D, no reliability requirements were stated in the implementing directives. The contractor was to measure the reliability of new systems through demonstration testing (Ref 35:39).

Groves and Winkler note that DT&E was completed and the results reported in August of 1969 and May of 1970. The results of initial OT&E were reported in April of 1969. With the two major test catagories complete, the system should have been ready for the first transition action, the RMB. Groves and Winkler state that based on personal knowledge of the program and substantiated by a lack of documentation, the F-4E RMB was not consummated until November of 1971, and then only by a verbal agreement between the SM and the PM (Ref 28:69).

Groves and Winkler state that the verbal RMB precluded formal documentation and listing of update change requirements, Engineering Change Proposals (ECP), and follow on DT&E requirements. The status and corrective action for over 100 deficiencies became diluted and many were ignored as time passed (Ref 28:70). The 1974 IG report also noted this problem and the PMRT regulations specifically attempt to avoid this situation by placing increased importance on residual tasks and requiring that residual tasks be tracked through completion.

Failure to document and track responsibilities was not caused by the transition process, but rather by a lack of formal documentation and careful tracking of responsibilities under the transition process. The situation could have been avoided by more careful program management. The PMRT process does not guarantee that responsibilities will be performed, but PMRT may prove to be advantageous simply because careful documentation and tracking of responsibility is emphasized.

After the verbal RMB, HQ USAF began to receive modification proposals from AFLC and update change proposals from AFSC, according to Groves and Winkler. The major subsystem affected was the new APQ-120 radar on the F-4E. The radar encountered reliability problems and AFSC did not want to transition, nor did AFLC want to accept, the radar until it could be improved. HQ USAF was gradually becoming concerned about divided management of the APQ-120.

In October of 1974, HQ USAF requested that AFSC/AFLC effect APQ-120 transition no later than 6 January 1975.

The two commands did not want to transition the APQ-120, and noted that such action would fragment and complicate management authority (Ref 28:70-71). It appears that HQ USAF felt that divided responsibility could be reduced by transitioning the program to AFLC, thus making AFLC responsible for all modifications. The two commands, on the other hand, felt that the APQ-120 needed improvement and should remain with AFSC. The RMB had passed, and AFLC had management and funding responsibility for retrofit changes (configuration changes accomplished after production delivery). AFSC was still responsible for configuration changes made on the production line, and still retained engineering responsibility.

Interviews with people in AFSC and AFLC substantiate the fact that both commands wanted to delay transition so that AFSC could manage the engineering effort to correct deficiencies in the program, primarily involving the radar for the F-4E. HQ USAF did not agree with delaying transition and wanted AFLC to be responsible for all configuration changes. While the controversy over the F-4E radar was taking place, the PMRT concept was initiated. Based on PMRT policy, HQ USAF now had more reason to insist on an earlier transfer.

Groves and Winkler state that the Air Staff requested that PMRT of the F-4 program take place as soon as possible, and if the program could not transfer, then the radar should transfer on 30 June 1975. The two commands were again reluctant to transfer the program and recommended a transfer date of 1 October 1976, which coincided with the end of USAF

aircraft production. The commands maintained that an earlier transfer date would result in so many residual tasks that there would be no genuine transfer of program management responsibility, and considerable fragmented management would result (Ref 28:72).

HQ USAF had the final word, and directed that the F-4 program transfer. Groves and Winkler quote the final AF direction as follows (Ref 28:72):

> The intent of AFR 800-4 is to transfer, as early as possible, program management responsibility to the agency that will support the equipment through its life cycle. The coordinated Air Staff position is that the F-4E Program Management Responsibility Transfer Date (PMRTD) will be 1 October 1975. Subsystems/ Equipments can be listed as exceptions in the agreement with separately established transfer dates. However, this headquarters will be informed ASAP if there are any systems/subsystems which will not transfer by 1 Oct 75 and a briefing with rationale for the exception will be presented to CSAF/LG.

HQ USAF concern to reduce fragmented, duplicative management is one reason that PMRT was directed to take place earlier than the recommendations of AFSC and AFLC. Several of the people interviewed during this study indicate that another reason may have been to provide a first service test of the new PMRT process.

The 1974 IG report brought attention to program transition from AFSC to AFLC. Regulations implementing PMRT were aimed at correcting problems identified in the IG report. The Air Staff was anxious to test the new process, and directed the early transfer date. If the new PMRT process had not just been initiated, HQ USAF may have gone along with the recommendations of the commands, and may have delayed transfer.

Regardless of the reasoning behind directing an early transfer, the result was that 1 October 1975 was the date directed by HQ USAF and the date on which transfer occurred. Some planning for the F-4 transition had already taken place, and transition efforts were redirected to comply with the new PMRT procedures. For example, an ETP had been prepared, and required only slight modification to be used as the engineering functional area in section B of the PMRT Plan (Ref 30). The result of the transfer effort is the F-4 PMRT Plan, which is discussed in the following section.

F-4 PMRT Plan

The F-4 PMRT Plan is organized according to the format directed by regulation, as stated in chapter III of this study. That format is followed in this discussion of the PMRT Plan. Section A covers general provisions of the PMRT Plan. Section B covers specific requirements, and Section C addresses the transfer agreements. Statements taken from the plan (Ref 35) are single spaced and comments by the writer are double spaced. The statements taken from the plan are not verbatim quotes and have been shortened and clarified for ease of discussion here.

Section A: General:

1. Background: This section explains what portions of the F-4 program have been transitioned to AFLC under the regulations prevailing at the time. The PMRT Plan provides management transfer of remaining F/RF-4 weapon systems, in particular the F-4E, RF-4E, and F-4F for both USAF and Security Assistance Programs. The plan contains a subsystem plan for J79-GE-15/17 engines.

Under the old transition policy, subsystems common to different MDS aircraft were not transitioned until the last MDS aircraft. The J79-GE-15 engine was used in the F-4C and F-4D, and still had not transitioned to AFLC. The J79-GE-17 engine is the new engine that was installed in the F/RF-4E. If the entire F-4 program had been subjected to the PMRT policy, the J79-GE-15 engine would have transferred with the first MDS aircraft, the F-4C.

> 2. Purpose: The purpose of the plan is to establish target dates and command responsibilities for transfer of program management responsibility from the AFSC SPO to the AFLC SM/IM.
>
> 3. Scope: The plan is applicable to all elements of AFSC and AFLC concerned with the acquisition, support, or operation of the F/RF-4 system.
>
> 4. Authority: The authority for the transfer is AFR 800-4 and the CSAF/LG message 141224Z May 1975, which established 1 October 1975 as the transfer date.
>
> 5. Policy: PMRT includes all equipment, systems, and subsystems applicable to the F/RF-4 program. As of the PMRTD, AFLC will assume overall management and engineering responsibility. This responsibility includes engineering and configuration management in support of on-going production programs. Following the PMRTD, AFSC will be responsible to accomplish the non-transferrable tasks listed in Appendix II. Formal AFLC requests for engineering and development support for tasks other than those listed in Appendix II and III will be negotiated on a case by case basis. The TWG will identify, coordinate, and track residual tasks. The TWG is responsible to the F-4 PM up to PMRTD and is subsequently responsible to the F-4 SM at the Ogden ALC. Focal points for the PMRT Plan are the ASD SPO (F-4) and the AIC Material Management Division at the Ogden ALC.

The policy section points out several aspects of the transfer that differ from the old transition policy. Overall management and engineering responsibility transfer to AFLC as of the PMRTD. Since AFLC has engineering responsibility after

PMRTD, AFLC must request any required engineering support from AFSC for tasks other than those identified in Appendix II (non-transferrable tasks) and Appendix III (residual tasks). "Non-transferrable task" is a new term and is defined in the following section.

> 6. Definitions: Non-Transferrable Tasks: Those tasks that are not time limited and are part of the stated mission of AFSC. Residual Tasks: Those tasks having an expected completion date related to an identifiable event, and there is something tangible to transfer, e.g. data, hardware.

Residual tasks are defined in PMRT regulations, but non-transferrable tasks are not mentioned in the regulations and first appear in the PMRT Plan. The previous discussion on the mission tasks of AFSC pointed out that these tasks could be subject to broad interpretation. The definition and listing of non-transferrable tasks in the PMRT Plan is an effort to more clearly define the specific mission responsibilities of AFSC, as they relate to the F-4 program.

Section B: Specific Requirements: This section lists specific requirements in 11 functional areas. Some of the specific requirements involve detailed discussions of how a particular functional responsibility will transfer to AFLC. The complete discussions are not repeated here, but general content is listed to develop the PMRT analysis.

> 1. Program Documentation and Records: This section lists these records and identifies AFSC and AFLC responsibilities in transferring the records to AFLC.
>
> 2. Engineering Data: These data are furnished by the contractor, and AFSC will continue to furnish engineering data to AFLC.

3. Technical Orders and Data Management: These items are managed in accordance with Technical Order (T.O.) directives, and the items are listed. The T.O.s are furnished by the contractor, and AFSC manages the active contract. Therefore, AFLC will not assume management and funding responsibility for T.O.s until six months after delivery of the last production F-4E. AFLC will review T.O.s, as they are published by the contractor, and submit corrections to AFSC for contractual implementation. After AFLC assumes data management responsibility, new requirements will be submitted to AFSC, with funding, for contractual implementation.

Further elaboration of data management may aid in understanding the problems encountered. Most of the data in a program are provided by the contractor, and requirements for specific data are written into the contract. Since AFSC retains the responsibility to manage open contracts on major systems, new data requirements must go through AFSC to be put on the contract. Additionally, the F-4E contract stipulated that the contractor had until six months after last delivery to prepare and submit some of the data. As a result, AFSC had to remain involved in the F-4 program to contract for data requested by AFLC. AFSC could be assured of continuing data contracting for at least six months after the last production aircraft. Thus, data management was still divided between AFSC and AFLC after the PMRT.

4. Engineering: Effective 1 October 1975, AFSC transfers and AFLC accepts engineering responsibility for the F-4 program, with certain exceptions.

Transfer of program engineering responsibility is further classified into five additional sections. Section A lists subsystems/equipment/components for which engineering responsibility transfers to AFLC, and includes airborne equipment,

aerospace ground equipment, and training equipment. Section B lists equipment for which engineering responsibility will not transfer. Section C discusses reliability requirements for the F-4E. Section D lists specific engineering programs and explains whether or not the program is to be transferred to AFLC. Section E outlines responsibilities of AFSC and AFLC.

The list of equipment in section A takes up twenty pages and includes equipment transfer to all five of the ALCs. Each ALC is listed along with the prime items for which that ALC is responsible. The problems of coordinating the transfer agreement, mentioned in chapter III, are substantiated by the fact that all five ALCs are concurrently involved in managing equipment used on the F-4.

Engineering responsibility is not transferred for the items listed in section B because the Special Weapons Center or the National Security Agency is responsible for these items and the items are used in other systems still in production. The items listed in section B involve sensitive equipment from a security standpoint, and require special management.

Section C discusses reliability requirements for new items on the F-4E. No reliability requirements were stated in the implementing directives, since the F-4E is essentially an "off the shelf" F-4D with some modifications. New system reliability is to be demonstrated by the contractor through demonstration testing. This section lists the new items and the results of any demonstration testing to date.

Section D of the engineering transfer identifies 21 engineering programs and notes whether or not the program is to be transferred to AFLC. Six of the programs are broad engineering programs and all six transfer to AFLC. The remaining programs are specific engineering efforts, for a specific piece of equipment or engineering change. The specific programs that have demonstrated reliability transfer to AFLC. Programs that are still in review, have not yet been funded, have not yet been qualified (demonstrated reliability), or have been directed to AFSC, remain the responsibility of AFSC. Several specific programs involve FMS systems and do not transfer because they require no follow on support.

Section E, under the engineering function, designates AFSC and AFLC responsibilities as follows:

AFSC will: Provide system and acquisition engineering.
Make operational engineering decisions until PMRTD.
Provide engineering for residual tasks after PMRTD.
Provide engineering and development support to AFLC, on request, on a case by case basis.
Provide engineering files to AFLC.
Identify action offices/target dates for engineering residual tasks.

AFLC will: Assume total engineering responsibility for the F-4 on the PMRTD.
Provide all engineering efforts after PMRTD, except for residual tasks.
Acknowledge the physical arrival of engineering records.

The engineering responsibilities stated in the PMRT Plan appear to the writer to be slightly misleading. AFLC responsibility supposedly includes total engineering responsibility. However, AFSC provides engineering support to AFLC for many

engineering tasks, including non-transferrable tasks, residual tasks, new development effort, procurement, and contractual implementation. Several interviewees pointed out that most of the actual engineering work on a program is performed by the contractor; AF engineering primarily involves overseeing or checking the engineering effort performed by the contractor. Most engineering is implemented through an active AFSC contract, and AFSC provides the support to monitor engineering performed under the contract. In reality, AFSC retains a great deal of engineering responsibily. Total engineering responsibility does not transfer to AFLC on the PMRTD; thus, the implication of dual responsibility for engineering management still exists.

5. Configuration Management: Configuration management and documentation transfers to the Ogden ALC. If an ECP is approved by the ALC Configuration Control Board (CCB), the ALC will identify a procurement requirement and forward this requirement to the F-4 SPO for contractual implementation.

Configuration management is another area where program responsibility remains fragmented between AFSC and AFLC. Although the program transfers to AFLC, and the CCB in the ALC evaluates and approves configuration changes, AFSC must still process and implement the changes through the active contract. To properly evaluate and engineer configuration changes, AFSC retains some configuration tracking ability and retains engineering expertise to provide configuration support to AFLC.

6. Materiel Support: Materiel support was assumed by AFLC at the beginning of OT&E (23 October 1967). Spares are managed by the ALC. Peculiar support equipment is provided by AFSC and common support equipment is provided

by AFLC. At PMRTD, AFLC receives responsibility for all support equipment except for development of new support equipment, which remains an AFSC responsibility.

7. Transportation and Packaging: The ALC is now responsible for most of the transportation and packaging function. The ALC will coordinate with ASD to obtain any remaining packaging data.

8. Procurement: Active airframe production contracts, advanced avionics orders, and production responsibilities incident to active contracts are listed, and these responsibilities do not transfer.

As mentioned, the procurement function for major systems and for systems or equipment requiring development is an area identified as an AFSC mission responsibility. The tasks associated with procurement, especially contract management, remain an AFSC responsibility under PMRT. Since AFSC alone performs the procurement function for major systems, the procurement responsibility is not divided between AFSC and AFLC, but overall program management responsibility is divided. Because the SPO must continue to perform the procurement function after PMRT, necessary people and expertise must continue to be retained by the SPO. Managing active procurement contracts can turn out to be an extended task, since most contracts run for many years, and contracts may remain open for several years after the aircraft have been delivered. Thus, another factor keeps the SPO from rapidly phasing down manpower requirements.

9. Budgeting and Funding: The USAF F-4E has been in procurement since 1966. The current production program is funded by fiscal year 1974 3010/1000 appropriations (aircraft procurement appropriations). Two SAP payback and seven other SAP programs are funded by 3010/1800 (aircraft procurement/other than USAF) appropriations.

The F-4 program scope is indicated by the fact that in addition to USAF procurement, nine Security Assistance Programs (SAP) are managed by the F-4 SPO. The SAP programs

complicate financial management. Financial arrangements for each foreign country may vary. The two SAP payback programs illustrate this issue. Payback programs involve aircraft that the US has delivered to a foreign country. To pay for these aircraft, the foreign country finances replacement aircraft off of the production line, and the new aircraft are delivered to the USAF. Thus, the F-4 financial managers faced the problem of budgeting and funding for 9 SAP cases, two of which were payback programs, and the USAF program.

The remainder of the budgeting and funding section lists AFSC and AFLC responsibilities as follows:

AFSC will budget and fund:

1. R&D requirements and major end item production requirements. This includes all open and new F/RF-4 SAP cases, and the responsibility will remain with AFSC until contract closeout.
2. All non-transferrable tasks and residual tasks.
3. Price settlements on AFSC funded contracts.
4. Update changes approved by AFSC prior to PMRTD.
5. Developmental/peculiar aerospace ground equipment until transferred.
6. AFSC travel requirements to accomplish tasks.
7. Seek Eagle (a weapon certification program) through June of 1976.
8. F-4C/D aircraft structural integrity program.
9. J-79 Component Improvement Program through December of 1976.
10. USAF F-4E technical data changes, as described in the engineering section, through June of 1977.

AFSC will also control all fallout funds resulting from negotiation, cancellation, or termination of AFSC funded contracts.

AFLC will budget and fund:

1. Retrofit configuration changes approved with the PMRT Plan.
2. New F-4 weapon system tasks/requirements after the transfer date, except those excluded in the plan.
3. F-4C/D aircraft structural integrity program article teardown inspections.
4. Any follow on requirements to 3 above.

Attachment 1 lists ECPs and notes that AFSC will budget and fund for ECPs through fiscal year 1976 and AFLC will budget and fund for ECPs after that date.

Budgeting and funding is a complex function in any program, and is important for successful program management. The transfer process would seem to complicate budgeting and funding problems. Mr. George C. Kuntz, as Chief of the Financial Management Division in the F-4 SPO, participated in the financial negotiations for the F-4 transfer. Mr. Kuntz indicated that the complex financial arrangements presented difficulties, but the difficulties were overcome by close cooperation between AFSC and AFLC financial managers. Mr. Kuntz further commented that the key to effective financial management was adequate planning time for the budgeting and funding cycle. Although the F-4 transfer would not seem to allow time for this planning, Mr. Kuntz stated that quarterly financial reviews kept the program on track and worked out any difficulties presented by the short planning time (Ref 31).

10. F/RF-4 Security Classification: Ogden ALC receives responsibility for security reclassification and declassification after the PMRTD. ASD will check material for currency prior to transfer.

11. Environmental Assessment: ASD has environmental assessment forms and data and will transfer these data to AFLC.

Section C: Transfer Agreement: AFSC has responsibility for non-transferrable tasks listed in Appendix II and residual tasks listed in Appendix III to the Transfer Agreement. AFSC retains responsibility until the indicated completion date. If the completion date changes, the TWG will establish a new completion date. All other tasks incident to management of F/RF-4 weapon systems, both USAF and SAP, become the responsibility of AFLC on the PMRTD. Included is a milestone chart showing actions leading to PMRT, and covering May through October of 1975

Appendix II: Non-transferrable tasks:

Contract Administration:

1. Active airframe/engine production contracts.
2. Scan converter dispay system contracts.
3. Advanced avionics orders against 1973/1974 basic order agreements.
4. Execution of any future F/RF-4 airframe production contracts.
5. Placing peculiar aerospace ground equipment orders through August of 1977.
6. SAP billing and resolution (AFSC cases).
7. Production responsibility and responsibility for aircraft bailments executed before 1 October 1975.

Financial Administration:

1. Budgeting and funding R&D requirements and major end item production.
2. Administering SAP cases currently open or directed to ASD, until case closeout.

Nuclear Weapons:

AFSC retains nuclear weapon responsibility in accordance with AFSC/AFLC supplement 1 to AFR 800-4.

Advanced Avionics:

AFSC retains responsibility for F-4E advanced avionics consolidated management, as directed by the AFSC Commander.

Production Line Close Down:

AFSC will manage production line close down at the end of system production.

These non-transferrable tasks indicate how the TWG interpreted AFSC mission tasks for the F-4 program. Active contracts remain with AFSC. Future orders placed against AFSC contracts are the responsibility of AFSC. Budgeting and funding for R&D requirements and major end item production is an AFSC responsibility. Certain aspects of nuclear weapon programs, especially manuals and checklists, remain an AFSC and Air Force Weapons Laboratory responsibility. Production line close down is an AFSC responsibility. The Advanced Avionics Integration Program, a special avionics development program, was directed to AFSC

in a PMD, and remains an AFSC responsibility (Ref 25). Under current PMRT procedures, these non-transferrable tasks never transfer to AFLC, and create permanent divisions in program management responsibility.

Appendix III: Residual Tasks:

Appendix III lists 21 residual tasks. Rather than listing each task in this study, residual tasks are discussed generally to indicate the nature and duration of these tasks. All of the tasks involve specific work to be done by AFSC. They include development, procurement, testing, qualification, modification, and support tasks, and all have estimated completion dates within two years of the PMRTD. Three tasks have completion dates in 1975, 12 have completion dates in 1976, and six are scheduled for completion in 1977. The last task is scheduled for completion in July of 1977.

Appendix III also assigns the responsibility to the TWG for tracking and updating the residual task listing on a monthly basis. The TWG will forward a quarterly status report to AFSC and AFLC. The status of residual tasks, as of 31 July 1977, indicates that a few of the tasks have passed projected completion dates and will require AFSC participation beyond original estimates. Minutes of a July Management Assessment Review Meeting indicate that six of the original residual tasks are still not completed (Ref 30).

One of the open residual tasks involves the APQ-120 radar, discussed earlier as the central attraction in initial efforts by the Air Staff to reduce fragmented responsibility in the F-4 program. An altitude line improvement program,

for the APQ-120 on FMS aircraft, is still managed by AFSC, even though the APQ-120 has officially transitioned to AFLC.

Another residual task illustrates how a new requirement compounds the transfer process. An avionics improvement program for a foreign country is still continuing because the foreign country requested additional capabilities after PMRT. Additional capabilities cause delays in completing residual tasks. As one interviewee stated, anytime a new capability is added, the added time requirement to qualify the new capability must be recognized and accepted. The residual tasks are not the result of unnecessary changes, but result from wanting better necessities (Ref 38). Thus, any improvement in the realm of a residual task will probably result in some delay in completion of the task and thus will prolong AFSC participation in a program that has transferred to AFLC.

FMS programs in general tend to extend residual tasks and compound the transfer process. Several interviewees pointed out that FMS programs involve peculiar avionics, and these peculiar avionics have to be qualified by AFSC prior to transfer. The FMS programs usually run later than USAF programs, because foreign countries buy into the program after the USAF program has started. Thus, qualification of FMS peculiar items usually occurs at a later time than qualification of USAF items. Several of the residual tasks in the F-4 transfer involve FMS programs.

FMS programs also compound the transfer process because T.O. management is more difficult. T.O. data released to foreign countries vary from the T.O. data on USAF programs, and the data vary from one foreign country to another. Some classified T.O. data are not released to certain foreign countries. This means that some data sent to a foreign country have to be purged of sensitive material. Also, the material that is purged is not the same for each foreign country, so the data must be individually treated and corrected for each foreign country. One interviewee indicated an apparant reluctance on the part of AFLC to accept this task of purging T.O. data. AFLC would rather leave this task to AFSC, since AFSC has been more closely involved in the FMS program. Thus, at transfer time, AFLC has an added aversion to the early acceptance of T.O. data responsibility.

It is readily recognized that non-transferrable tasks and residual tasks require that AFSC remain actively involved in program management after the PMRTD. Non-transferrable tasks are not time limited, and remain with AFSC because they are defined as AFSC mission tasks. Residual tasks remain with AFSC until completion. In the F-4 PMRT, some residual tasks are still open, two years after the PMRTD. PMRT policy advocates transferring total program responsibility to AFLC, but as long as AFSC retains non-transferrable tasks and residual tasks, program management is destined to remain divided between AFSC and AFLC.

A separate attachment to the basic PMRT Plan transfers program management responsibility for the F-4 engines. The attachment follows the same format as the basic plan, and is not repeated in this study. However, engine management is a special case of subsystem management, and warrants discussion.

A propulsion SPO was created in ASD in 1976. The purpose of the propulsion SPO is to provide extended procurement and engineering responsibility for aircraft engines. The propulsion SPO is jointly manned by AFSC and AFLC personnel, and this SPO has proposed to manage engines at one location until engine production is complete and the engine has reached full maturity. Then, the engine management would transfer to an ALC. Under the engine management concept, engine transfer should be an exception to AFR 800-4 policy (Ref 37).

This new concept for managing engines allows AFLC an earlier and more thorough interface with AFSC, but adds one more agency to PMRT negotiations. The inclusion of AFLC personnel in the propulsion SPO could facilitate a smooth engine transfer to the ALC, since AFLC expertise is available throughout the life of the engine program. However, the criteria for when to transfer the engine to an ALC, proposed by the propulsion SPO, differ from the criteria in the PMRT directives. The proposed criteria include the end of engine production when the engine has reached a mature, or stable condition. This criterion approximates the criterion of transition at the end of production, which was used under

the old transition policy. The result could be that a system and the associated engine transfer at different times, which seems to be contrary to the intent of PMRT.

The principle of the propulsion SPO, of managing an engine in an organization other than the system related SPO, is a reversal of previous policies of total system management in one SPO. The engine SPO will have to work closely with the airframe SPO to integrate the engine, and any changes, into the weapon system. This is another situation that will be watched with interest to see how the engine management concept may affect other program management policies and procedures.

To conclude this discussion of the PMRT Plan, the three main sections of the plan are summarized here. Section A: General Provisions, provides background, purpose, scope, authority, policy, and definitions for the plan. The general provisions indicate differences between the old transition policy and PMRT. Common subsystems/equipment transfer with the first MDS aircraft. PMRT theoretically includes overall management and engineering responsibility. Non-transferrable tasks are part of the stated mission responsibility of AFSC.

Section B: Specific Requirements, contains the main functional areas of program management and describes what responsibility will and will not transfer. Contracting for data remains an AFSC responsibility and fragments responsibility between AFSC and AFLC. The engineering functional

area lists programs and equipment and whether or not engineering responsibility for these programs and equipment will transfer. The engineering responsibility that remains with AFSC indicates that total engineering responsibility does not really transfer to AFLC, and appears to continue to fragment responsibility between the two commands. Configuration management responsibility is also divided to some extent, since AFSC must process and implement configuration changes requiring proc ment or new development. Procurement of major systems or systems requiring development is an AFSC mission task, and further divides total program responsibility between AFSC and AFLC. Budgeting and funding require adequate planning time, and the transfer process compounds financial management.

Section C: Transfer Agreement, specifically lists non-transferrable tasks and residual tasks. These tasks remain an AFSC responsibility after program transfer and divide program responsibility between the two commands. Non-transferrable tasks are not limited in duration. Residual tasks tend to slip beyond completion dates if new requirements are added.

An overall impression, from the F-4 PMRT Plan, is that total management responsibility does not transfer to AFLC on the PMRTD. Many responsibilities remain with AFSC, and hoped for reductions in SPO personnel may not be realized, as the SPO must continue to work on the numerous tasks that remain after the PMRTD. The next chapter reports some of the results of interviews conducted for this study, and further validates the existence of divided program responsibility after PMRT.

V. Evaluation of Interview Responses

Regulations directing PMRT are discussed in chapter III. The F-4 PMRT Plan is discussed in the previous chapter. This chapter consists primarily of responses to the interviews conducted for this study. A complete list of the interviewees and their particular area of expertise is provided in Appendix A. The interviews were all unstructured, and concentrated mainly on the particular area with which the interviewee was most familiar. Because of the unstructured nature of the interviews, no empirical results can be reported. The interviews are important to validate some of the PMRT problems mentioned previously, and to identify other problem areas.

The interviews conducted for this study complement the previous discussions of regulations and the F-4 PMRT Plan. The interviews covered a wide range of subjects related to PMRT, and raised many interesting points. Most of the interviews were confined to the F-4 program, but many of the people who worked on the F-4 program are now working in other positions. Relevant comments from these people are included, even though they relate to other programs.

All of the interviewees expressed a common desire to provide effective and efficient program management. Many shared similar views about the PMRT process in general. While the people interviewed generally agreed that problems do exist in the PMRT process, and generally agree on what these problems are, there were differing opinions on how

to solve these problems. Each interviewee tended to view the solutions to the problems through a particular perspective. These perspectives included command viewpoints and functional area, or expertise, viewpoints.

The thrust of this thesis is to identify any problems in the PMRT process, but some of the proposed problem solutions are included. The purpose of including these solutions is to stimulate interest and offer some assistance or insight for use in solving existing problems. No attempt is made here to evaluate the proposed solutions.

One caution should be noted, regarding solutions to problems associated with PMRT. PMRT is an inherently complex process, and all the various interests involved in the process display interdependencies. Cleland and King make an important point that the solutions to such problems will have an equal degree of interdependency and complexity (Ref 21:4). Easy solutions or simple solutions do not appear to be forthcoming. Any proposed solution to a specific problem may have profound effect on other problems or other interests affected by the solution. Proposed solutions should be evaluated thoroughly and carefully, so that the full effect of the solution may be realized. A systems approach to resolving PMRT problems is clearly indicated.

As a complex process, PMRT involves various interests from several commands. In each command, numerous functional areas are involved in and affected by the PMRT process. Integrating these various interests is a difficult task, but a

task that must be performed in negotiating a PMRT Plan. The interview responses provide some indication of the various interests that interact in the PMRT process. These interviews do not represent all possible interests or viewpoints involved in PMRT, but are meant to provide a representative sample of opinions from AFSC and AFLC.

Faced with the difficulty of reporting interview results in a cohesive manner, the writer recognized and developed a common classification structure for relating interview responses in a logical development and discussion. The responses are generally related to basic functions of management. This chapter of the study groups the interview responses according to the basic function of management with which they are most closely associated.

The organization and discussion in this chapter serves three purposes. First, the responses to the interviews are documented to provide a general representation of how people at the working level view PMRT. Second, relating the responses to management functions may suggest how management principles can contribute to the success of PMRT. Third, this chapter elaborates on and ties together many of the ideas presented in earlier chapters.

The management functions used in this discussion are taken from the modified process school of management thought, as described by George R. Terry in Principles of Management. For a complete discussion of management functions, the reader is referred to the text, listed in the bibliography (Ref 42).

Briefly, the modified process school views the work of the manager as subdivided into fundamental functions of any manager. When combined, these fundamental functions constitute the management process. Terry uses the classification of four functions, which are planning, organizing, actuating, and controlling. Terry summarizes the fundamental functions as follows (Ref 42:83):

1. Planning to determine the objectives and the courses of action to be followed.
2. Organizing to distribute the work among the groups and to establish and recognize needed relationships and authority.
3. Actuating the members of the group to carry out their prescribed tasks.
4. Controlling the activities to conform with the plans.

These management functions are not distinct activities performed separately, but are interrelated, ongoing functions. Managers can be involved in any or all of the functions at a particular time. Terry states, "Each fundamental function of management affects the others, and they are all intimately interrelated to form the management process" (Ref 42:85). This brief discussion of management functions is not intended as a course in management principles, but provides a framework for integrating the interview responses. The responses are now discussed, in relation to the management function with which the writer feels the responses are most closely associated.

Planning

The first consideration under the planning function is to establish a clear objective. This is a valid consideration for PMRT, since documents and opinions differ on the specific objective of PMRT. An objective of transferring management responsibility from AFSC to AFLC in some orderly and expiditious manner is generally agreed upon by the parties concerned with transfer of management responsibility. The more precise objective of when to transfer program responsibility is subject to interpretation. The AF regulations implementing PMRT provide broad criteria which still allow individual interpretation.

HQ USAF direction to transfer the F-4 program stated that the PMRT intent is to transfer the program as early as possible to the agency that will support the equipment throughout the life cycle (Ref 28:72). "As early as possible" is still subject to interpretation. There are indications that part of the desire for an early transfer is to allow AFLC earlier control of the program. Since operation and support costs are a major portion of life cycle costs, the notion is that the agency ultimately responsible for these costs should manage the program.

Differences between HQ USAF desire for an early F-4 transfer and AFSC/AFLC recommendations to delay the F-4 transfer indicate that the specific objective of when to transfer a program is a subject of controversy. Interviews with some of the people who prepared the original draft of AFR 800-4, and the AFSC/AFLC supplement, substantiate the

lack of a clearly defined objective of when transfer should take place, but also indicate that perhaps not every program should transfer at the same point in the acquisition phase.

The intent of the group that drafted the new PMRT directives was to make transfer occur earlier in the production phase, but still leave flexibility in selecting a transfer date. The flexibility is considered necessary to allow different programs, with different problems, to transfer at a time that is best for each particular program. Indications are that other programs, in addition to the F-4 program, may also experience disagreement in selecting the time for transfer.

One interviewee indicated that the intent for the F-16 transfer has been more clearly defined. AFLC direction to the F-16 TWG is to transfer as much of the program as possible, as early as possible. The idea is that the entire program may not necessarily transfer, but as many parts of the program as possible will transfer at an early date. The TWG recognizes that this transfer may result in numerous residual tasks, but the idea is to accomplish an early shift of responsibility to AFLC for systems/equipments which are ready to transfer. The F-16 transfer agreement is now in the process of a first iteration to establish a planning PMRTD. The initial transfer date is targeted for the 1980 time frame. Hopefully, this early planning, and more precise definition of PMRT intent, will facilitate a smooth transfer, but the possibility of later disagreement on criteria for transfer still exists.

In addition to setting overall and specific objectives, planning for PMRT is important to integrate efforts from different functional areas, and direct these efforts toward a coordinated PMRT. Each functional area requires adequate time to prepare for PMRT. The nature of the tasks performed by each command require lead time to prepare for the responsiblities that transfer. In light of these requirements, the PMRTD would ideally be selected as early as possible, and would not be changed. Practically, an early PMRTD is difficult to establish, and may predictably be subject to subsequent change if the PMRTD is selected so far in advance that the progress of the program cannot be accurately predicted.

Mr. Louis Hrkman, a Logistics Specialist in the AFLC Directorate of Resources Management, and closely involved in PMRT from the AFLC side, stated that one of the problems in selecting a PMRTD is that the TWG tries to select this date too early. Regulations direct that the PMRTD be established in the Full-Scale Development phase. The TWG usually selects an initial PMRTD early in Full-Scale Development. When the PMRTD is selected this early, it is likely to be changed. Mr. Hrkman recommends establishing a planning PMRTD later in the Full-Scale Development phase, when the program is more stable and the date is less likely to be subsequently changed (Ref 29). The initial date is not firm, and may be changed, but changing the date may upset the planning that has been done in other areas. There appears to be some sort of an

intelligent compromise necessary in the trade-off between selection of a date that allows adequate time to plan all other activities and selecting a later date that will not be so likely to have to change due to contingencies.

The budgeting and funding process provides a clear illustration of the lead time required to schedule other activities. The responsibility to budget and fund numerous activities transfers on the PMRTD. Mr. Kuntz stated that the budgeting and funding process in the AF requires three years of advance planning. The time to prepare and submit budgets through the various levels of review and approval, from the unit all the way through to congressional approval, requires three years lead time. Some funds can be moved between AFSC and AFLC within the three year period, but normal planning for financial management has to be accomplished at least three years in advance. Any movement of funds within the three year period requires special approval and is done outside the normal channels for budgeting and funding. Mr. Kuntz made a special point of noting that actual funds do not transfer from AFSC to AFLC; the responsibility for budgeting and funding transfers on the PMRTD. Each command must budget and fund for its own particular requirements. If the PMRTD changes after budgeting and funding has been accomplished, the possibility exists that a command may be left with a responsibility for which that command has no funds (Ref 31).

Planning for manning requirements is another area that requires lead time. Ideally, AFSC would like to phase down the SPO after PMRT, and reassign people into new projects. AFLC requires time to build up the organization to support a new system, prior to the system transfer to AFLC. AF personnel policies require time to prepare for personnel reassignments; people cannot be moved overnight to staff an organization in order to support a new requirement. One interviewee pointed out that while some senior AF officials expect rapid reductions in SPO manpower after transfer, the tasks remaining with AFSC usually have precluded such early reductions in the SPO. The F-4 SPO did not experience any drastic manpower reductions after PMRT. The F-4 SPO was merged twice with other SPOs, in 1976 and again in 1977, and is now part of the Fighter/Attack SPO. The Fighter/Attack SPO still has approximately thirty people working on F-4 tasks. Thus, continuing F-4 programs still require a sizeable SPO effort.

Manpower authorizations for the F-4 SPO (not including engineering support) did not reduce drastically after PMRT, on 1 October 1975. These positions numbered 88 in the first quarter of calander year 1975, and were only reduced to 80 by the first quarter of calander year 1976 (Ref 16). The F-4 mergers with other SPOs prevents a more accurate analysis of the F-4 personnel changes after the first quarter of 1976, but the previous observation that approximately 30 people

are still working on F-4 tasks indicates that the SPO personnel reduction remains a gradual process.

Engineering support to the F-4 SPO also experienced a similar gradual reduction, with some support still continuing. Engineering time charges to F-4 related projects indicate the following engineering support for the first quarter of each calander year (Ref 17):

1st Quarter of	Engineers Working F-4 Projects
1975	61
F-4 Transfer: 1 October 1975	
1976	46
1977	28

These figures are interpreted as the average number of engineers assigned to work on F-4 related projects during that quarter. Thus, during the first quarter of calander year 1977, an average number of 27 engineers worked full time on F-4 projects.

Planning time to build up the ALC organization was a problem in the F-4 transfer. An interviewee commented that the Ogden ALC was planning on a later transfer than the date directed by HQ AF. The six months planning lead time allowed by the AF directed transfer did not give the ALC enough time to man for the F-4 responsibilities. Early program transfer created a burden on the F-4 support personnel at the Ogden ALC, since the ALC was not adequately manned to manage the F-4 program.

Planning for manpower requirements is complicated by uncertain or changing transfer dates. Fragmented or overlapping responsibilities between AFSC and AFLC preclude a rapid SPO reduction after PMRT. In the F-4 example, PMRT compounded planning problems in both AFSC and AFLC.

The F-4 provides a good example of problems created by short planning time, since the HQ AF directed transfer took place six months after the direction to transfer the program was transmitted to AFSC and AFLC. The impact of this directed transfer on the two functions mentioned, budgeting and funding and manpower planning, was noticeable, but problems were overcome and the program did transfer.

Comments from the F-16 SPO indicate that some of the planning for program transfer is improving. Mr. Dave Franke, who was an ALC representative for the F-4 transfer and is now the F-16 Depot Program Manager, noted that one problem area encountered during the F-4 transfer has improved for the F-16 transfer. The F-4 SPO and the Ogden ALC lacked good coordination for data requirements, primarily because the ALC was not represented in the SPO with enough people, and also because of the short planning time caused by the AF directed transfer. At PMRT time, the ALC realized that it did not have enough data, and requested that the SPO provide these data through the contract with McDonnell Douglas Corporation. Requirements for extra data created additional SPO residual tasks (Ref 26).

The F-16 program has improved coordination between the SPO and the ALC for data requirements. The number of ALC representatives in the F-16 SPO, and close cooperation and coordination with counterparts in the Ogden ALC, have allowed early identification of data requirements, and these requirements are included in the contract. When PMRT time for the F-16 is reached, data requirements should be much less of a problem (Ref 26).

Several interviewees indicated that the PMRT process enhances planning for the transfer because the several different agreements formerly negotiated under the transition process are now combined into one PMRT agreement. The single transfer agreement is viewed as being easier to negotiate and to write than were the several transition agreements.

Another interviewee commented that early establishment of the PMRT date, and the difficulty in changing the date, facilitates and stabilizes other planning that depends on the PMRTD. Additionally, reduction of the number of separate transition agreements to one transfer agreement reduces some of the fragmented responsibility that existed when the management transition agreement had been negotiated separately, but the engineering transfer had not yet ocurred.

Another interview revealed one aspect of the transfer process that conflicts with the view that a single agreement simplifies the transfer process. In order to allow time to prepare the PMRT agreement, an AFLC working rule has been

established for a deficiency cut-off date six months prior to PMRT. This date is when AFLC stops identifying system deficiencies for inclusion in the PMRT Plan. Deficiencies identified prior to PMRT are an AFSC responsibility, and deficiencies identified after PMRT are an AFLC responsibility. The deficiency cut-off date is necessary if the entire transfer takes place on one date. AFLC deficiencies require time to be included in the PMRT Plan, and some cut-off appears to be necessary to allow this time. The AFLC procedure for doing this creates an additional cut-off date in the PMRT process, and a time period during which AFLC identified deficiencies are not processed. These deficiencies are held by AFLC until the PMRT agreement is signed, and then they are processed. The interviewee recommended establishing a definite PMRTD, and then allowing 90 days after the PMRTD to formalize the transfer agreement. This would allow deficiencies identified up to the PMRTD to be included in the transfer plan.

Proper planning may be considered a key to an effective program transfer. A well defined objective for the PMRT and adequate planning time could lessen or resolve many of the problems associated with PMRT. The planning function could also help avoid or resolve some difficulties addressed later in this chapter under the discussion of other management functions. The following section discusses the function of organizing.

Organizing

Many of the interviewees agreed that as long as the AF uses the current functional differentiation and resultant organization structures, and the current command jurisdiction over missions for acquiring and supporting weapon systems, some fragmented responsibility will result. AFSC has mission responsibilities which require program participation after transfer, and AFLC has mission responsibilities that require earlier interface; some overlap is inevitable.

The mission responsibilities of each command cause some of the fragmented responsibility that results after PMRT. This point is supported by one interviewee who noted that general management, engineering, and configuration responsibility is transferred to AFLC, but procurement and some financial responsibility remain with AFSC. This individual commented that in order to effect a total program transfer, procurement and financial management responsibilities must also concurrently transfer to AFLC. However, AFLC is not currently prepared to accept these additional responsibilities.

An ALC representative indicated that, at the present time, it would be difficult for an ALC to accept transfer of procurement responsibility. The ALCs currently lack manpower and expertise to conduct a large scale procurement program. ALC procurement is oriented toward small programs, such as follow on spare parts. To transfer procurement and total financial responsibility to an ALC would first require a buildup of manpower and expertise in the ALC, and a change in the basic mission responsibilities of the commands.

One interviewee summed up the overlapping responsibilities by stating that some overlap is inevitable, and necessary to provide program continuity, but the objective should be to provide continuity with a minimum of duplication between the two commands (Ref 38). The F-4 PMRT example indicates that numerous areas of overlapping responsibility and several areas of duplicated efforts remain.

The working group that developed and initiated the PMRT concept considered several alternatives in an effort to resolve difficulties identified in the old transition process. Some alternatives considered included combining AFSC and AFLC into one command, changing command missions, transferring a management team with the responsibility transfer, and changing the transition concept. The group recognized that some duplicative efforts may be resolved either by changing the existing command missions or by combining the commands. However, direction given to the working group from AF HQ levels precluded serious consideration of the alternatives of changing missions or the organizational structure. Within these constraints, the final outcome was PMRT, which was a change of the transition concept.

Another problem that persists under the PMRT concept involves the SPO interface with AFLC organizations. SPOs still encounter difficulties in coordinating PMRT Plans with the large number of affected AFLC agencies. At an AFSC/AFLC quarterly PMRT meeting, in June of 1977, one of the problems discussed was AFSC difficulty in coordinating PMRT Plans with

AFLC. The solution, recommended by AFSC, was to make the SM the focal point for all PMRT coordination (Ref 37). As previously pointed out, the DPML is the senior AFLC representative in the and becomes the SM after PMRT. The PMRT Plan is approved by AFLC and all the affected ALCs, and the DPML/SM is not in a position to act as an AFLC spokesman. While the DPML/SM could act to coordinate the plan through AFLC, and lessen the problem of the SPO, this solution merely shifts the coordination problem from the SPO to the DPML/SM.

The Acquisition Logistics Division in AFLC and the Propulsion SPO in AFSC are examples which indicate that the commands are willing to try new organizational developments. Several related studies used for background information in this thesis, and some of the people interviewed, recommend a reevaluation of the current AF organization structure. New organizational proposals range from changing command missions to returning to one command for all acquisition and support functions. Regardless of the organization that may finally result, the next management function, actuating, can help to achieve positive results in program management and in PMRT.

Actuating

Actuating is often referred to in other terms, such as directing, motivating, or moving to action. The motivational connotation often suggests human relations or behavioral approaches to management, which are important considerations for effective management. For purposes of this study, two

differing areas of meaning for "Actuating" are discussed: the first relates to motivating and conditioning people to want to accomplish a smoothly coordinated PMRT, i.e. human relations aspects, and the second involves the direction or instructions provided by AF regulations.

The people interviewed for this study appeared highly motivated and dedicated to program management in general, but considerably less enthusiastic about the PMRT process. Part of this lack of enthusiasm may be explained by the prevalent controversy over transfer time selection, as cited in the F-4 PMRT. Regulatory criteria for "when to transfer" provide latitude for individual program interpretation, yet AF HQ directed and implemented the F-4 transfer date against the recommendations of AFSC and AFLC. The group that prepared the PMRT directives intended to have flexible criteria that could be individually interpreted for each program, yet AF HQ direction indicated a different intent. Some of the working level PMRT negotiators are understandably confused over what the intent of PMRT really is, and thus cannot readily accept some elements of the PMRT concept.

The existing confusion over some elements of the PMRT tends to demotivate people with regard to the total PMRT process. Part of the demotivation may be explained by human and organizational intertia to resist change. Rominger recommended that the TWG be used to "spread the PMRT gospel", and thus help win acceptance and support for the PMRT concept (Ref 39:80).

The second view of the actuating function used here is that of direction or instruction. The amount of specific direction provided by PMRT regulations is another problem cited by several of the people interviewed. One interviewee noted that the old transition regulations more clearly spelled out the procedures for various functional areas to follow, both in negotiating transition and in post-transition actions. For example, each PMRT Plan now includes negotiation for specific budgeting and funding agreements. Many of the procedures that are now negotiated were more clearly spelled out under old transition policies. The respondent stated that the present situation is like each PMRT negotiation "reinventing the wheel". The point is that much recurring effort might be avoided by specifying and directing implementation of procedures to be followed for budgeting and funding.

Another interviewee cited a problem of processing ECPs after transfer. Each command has unique forms and procedures for processing ECPs, but no AF forms or standard procedures appear to exist for processing ECPs between the two commands. People working on the next revision to PMRT regulations indicate that more specific procedures will be included. However, specific and uniform procedures will be difficult to apply to each different program, due to the paradox of need for direction with concomitant need for latitude in tailoring for particular programs.

The quarterly PMRT meeting pointed out, and the interviews substantiated, a relative lack of transfer direction in PMDs.

The PMRTD is seldom endorsed by a PMD and HQ USAF seldom issues a PMD providing guidance for program transfer. The general opinion is that a PMD could clarify some of the confusion over selecting a transfer date, and could also present AF philosophy, policy, and procedural direction.

One interviewee stated that HQ USAF should direct an ALC buildup, to provide an ALC capability to accept the program, and should direct a SPO phase out after PMRT. This individual maintained that leaving this decision to the organizations involved (the SPO and the ALC) causes problems. The people in the SPO are reluctant to phase out their own jobs. The ALC has difficulty justifying additional manpower requirements to AFLC. The result is that the SPO remains in operation and the ALC is not manned to accept the program. In this respect, several interviewees suggested that a possible solution to manpower and expertise problems in the ALC might be provided by transferring people from AFSC to the ALC.

Controlling

Proper control over the transfer process could help in attaining PMRT objectives. The control over past transitions appears to have contributed to some of the problems mentioned in chapter II on transition, and in chapter III on the F-4 transition prior to PMRT. The lack of formal documentation or tracking for tasks after the F-4C/D transition indicates a lack of program control. One interviewee stated that the old transition process would have worked, had existing guidance

been adhered to and had the program been properly controlled. This individual suggested that the solution to transition problems was not a new transfer process, but a refinement of management procedures under the then existing transition process. This is a valid point, and axiomatic that if PMRT is to be successful, proper program management should be exercised, including program control.

Control in the PMRT process may be an area where PMRT proves to be better than the earlier transition process. As previously mentioned, PMRT specifically requires documenting and tracking of residual tasks. This requirement provides a built in control and reporting procedure to help insure that residual tasks are accomplished, but a regulatory requirement does not guarantee proper performance. Although PMRT spells out control procedures for tracking residual tasks, it does not mean that no further control effort is needed. Tasks require tracking and control to assure performance. The control process can provide a check on how PMRT is working and, hopefully, provide early indications of any interference in the planned PMRT events.

An innovative example of using technology for program control is provided by the F-16 SPO. This example involves data management in the F-16 program, which was discussed under the planning function. The F-16 SPO and the Ogden ALC both have computer terminals which are tied into a computer located with the prime contractor. These terminals provide the SPO and the ALC access to contractor data, which are all computerized (Ref 44). This system gives the SPO and the ALC an instant

data readout, and provides both with a complete set of data. The system now covers only portions of the data required, but if it can be expanded, a requirement for data transfer might be eliminated. The system fulfills a control function by insuring that each organization has all the data provided by the contractor. This system must still be controlled, however, to verify that the contractor has put all the required data in the computer.

Control helps to insure that actual performance is consistent with the plan. The control function refers back to good planning. For PMRT control to be effective, the overall plan, or objective, still appears to require refinement and further clarification. As mentioned, all of the management functions are important, and all are interrelated. Proper application of these management functions to the PMRT process could improve the effectiveness and efficiency of PMRT.

The next chapter in this study integrates this chapter and the previous three chapters in a summary presentation of research findings for the entire study. Many of the problems mentioned in this chapter also appear in other chapters, and the following chapter combines these problems for a comparison of the old transition process and PMRT.

VI. Research Findings and Comparative Analysis

Previous chapters present detailed discussions of problem areas associated with the transition and the PMRT processes. This chapter integrates and consolidates findings from the previous chapters and compares PMRT findings to problem areas identified in the old transition process. This chapter has two purposes: 1) The PMRT findings from the separate chapters on regulations, the F-4 PMRT Plan, and interview responses are presented in one chapter, and 2) The PMRT process is compared to the old transition process to determine if PMRT has resolved some of the problems that existed in the transition process. The primary objective of this study is to determine if PMRT has resolved some of the difficulties encountered in the old transition process, and the comparison in this chapter is directed to the primary objective.

Research Findings

The findings are presented in a listing of these findings as they are chronologically developed in previous chapters. Initial attempts to group these findings in meaningful classifications, such as an improvement over transition or in relation to a specific problem, were unsuccessful. The interdependencies of the findings and problem areas would require placing several findings in more than one problem category. Some of the findings appear to represent an improvement over transition in one area, but further compound problems in another area. Thus, the findings are merely listed as they were developed in the previous

chapters. For further discussion of the implications of a single finding, the reader is referred to the respective chapter. The findings are integrated and the impact of the findings is more thoroughly developed in the second section, which compares the transition problems to the PMRT process.

Chapter III: Air Force Directives for PMRT:

1. PMRT includes all program responsibilities in a single agreement with one effective date. The single transfer agreement includes the separate agreements negotiated under the transition process.

2. Residual tasks are defined as tasks within the mission jurisdiction of AFSC and remain with AFSC until completion.

3. The definition of residual tasks is subject to different interpretations.

4. A TWG is the focal point for PMRT efforts and provides initial PMRT coordination.

5. AFSC and AFLC organizational structures and management orientations cause coordination problems during PMRT negotiations. AFLC includes numerous agencies in review and approval channels for the PMRT agreement. AFSC centralizes PMRT approval authority in the SPO.

6. General budgeting and funding guidance is provided, but specific procedures require further definition in the PMRT Plan.

7. Common subsystems transfer with the first MDS aircraft.

8. Major procurements and continuing or new engineering development remain the responsibility of AFSC after transfer.

9. Management of active contracts for major programs remains an AFSC responsibility after transfer.

10. The determination of what military data will transfer is subject to interpretation and negotiation.

11. FMS programs compound transfer problems.

12. The large number of functional areas involved in PMRT indicates the scope of the coordination problems faced by the TWG.

13. Residual tasks are specifically listed and tracked by the TWG.

14. AF guidance for selection of a transfer date is at the earliest practicable date in the production phase.

15. Once the transfer date is established, it is difficult to change.

16. AF intent seems to provide for an earlier transfer, but still allows flexibility in determining the date.

17. Selection of a date for past transitions and transfers has been controversial and subject to disagreement.

18. AFSC/AFLC guidance for selecting a transfer date is when the system is operational and no longer requires development engineering.

19. The guidance for selection of a transfer date is broad and subject to interpretation.

20. Some of the regulations that indirectly affect PMRT have been revised to reflect PMRT policies. Most of the regulations that have not been revised are general enough to avoid conflicting with PMRT guidance, but AFR 57-4 and AFR 800-12 do conflict with PMRT guidance.

Chapter IV: Analysis of the F-4 PMRT:

1. Portions of the F-4 program had transitioned under the old transition policies prior to the implementation of PMRT.

2. The F-4E RMB was a verbal agreement which precluded formal documentation and tracking of subsequent tasks.

3. AF HQ directed F-4 transfer at a date earlier than that recommended by AFSC and AFLC.

4. The earlier transfer date resulted in more residual tasks for AFSC.

5. Non-transferrable tasks are tasks that are not time limited and fall within the mission jurisdiction of AFSC.

6. The mission jurisdiction of AFSC is subject to broad interpretation.

7. New data requirements must be processed through AFSC to be placed on a contract.

8. F-4 program responsibility transferred to all five ALCs.

9. Engineering programs still in review, not yet funded, or directed to AFSC remain an AFSC responsibility after transfer.

10. Although AFLC supposedly receives total engineering responsibility, the tasks that remain with AFSC require that AFSC continue to provide engineering support after PMRT.

11. After transfer, AFSC processes and implements configuration changes so that these changes may be placed on contract.

12. AFSC must retain some configuration and engineering expertise to process configuration changes.

13. Procurement of major systems or systems requiring development remains an AFSC responsibility.

14. The SPO must retain expertise to perform the procurement function.

15. Financial management is made more difficult by SAP cases.

16. The key to effective financial management is adequate planning time.

17. Although the F-4 transfer did not allow much planning time, financial problems were resolved.

18. F-4 non-transferrable tasks include active contracts, future orders placed against AFSC contracts, budgeting and funding for R&D requirements and major end item production, elements of nuclear weapons programs, production line close down, and programs specifically directed to AFSC.

19. The F-4 transfer agreement includes 21 residual tasks involving development, procurement, testing, qualification, modification, and support.

20. The F-4 residual tasks were scheduled for completion within two years of the PMRTD.

21. New requirements tend to delay the completion of residual tasks.

22. Some F-4 residual tasks have been extended beyond original completion estimates.

23. FMS programs tend to extend residual tasks and compound the transfer process.

24. Engine management in the Propulsion SPO is an exception to managing an entire system in one SPO.

25. Criteria for engine transfer from the Propulsion SPO to an ALC conflict with PMRT criteria for program transfer.

Chapter V: Evaluation of Interview Responses:

1. There is general agreement that problems exist in the PMRT process, but there is not general agreement on the solutions to these problems.

2. PMRT problems are complex and interdependent, and a systems approach is required in any attempts to resolve these problems.

3. Proper application of management principles may contribute to the success of PMRT.

4. PMRT lacks a specific objective for when program transfer should take place, and this is a subject of controversy.

5. The intent of the group that initially drafted PMRT regulations was to provide for an earlier transfer, but still allow latitude and flexibility for individual programs.

6. Early transfer in other programs will result in more residual tasks than would a later transfer.

7. A compromise appears to be necessary in the trade-off between selecting a transfer date early enough to allow proper planning for other activities and a later selection that will make the date less susceptible to change.

8. Budgeting and funding through normal channels requires three years lead time for planning.

9. Late changes in a transfer date may result in a command having responsibility for a task without the necessary funds to accomplish the task.

10. Planning for manning requirements requires adequate lead time.

11. The F-4 SPO experienced gradual reductions in manpower after the PMRT.

12. The short planning time for the F-4 transfer created problems for and placed a burden on ALC support.

13. Although the F-4 transfer allowed little planning time, problems were overcome and the program did transfer.

14. The F-4 program experienced coordination problems with respect to data. Additional data for the ALC resulted in additional SPO residual tasks.

15. The PMRT process enhances planning for transfer because the several transition agreements are combined in one agreement with one effective date.

16. Early establishment of the PMRT date and the difficulty in changing the date stabilizes and facilitates other planning requirements.

17. An AFLC deficiency cut-off date adds another breakpoint to the PMRT process, and conflicts with PMRT intent to use only one management breakpoint.

18. The mission responsibilities of each command cause some of the fragmented responsibility that results after PMRT.

19. Transfer of procurement and total financial responsibility would reduce divided responsibility, but the ALCs are not currently prepared to accept these responsibilities.

20. Coordination problems between the SPO and AFLC agencies continue to create problems.

21. AFALD and the Propulsion SPO provide examples of new organizational structures within AFSC and AFLC, and indicate attempts at improving program management.

22. Although personnel appear enthusiastic about program management in general, a lack of enthusiasm exists for the PMRT process.

23. The lack of enthusiasm for the PMRT process may be explained in part by the lack of a specific objective for PMRT and by normal human and organizational resistance to change.

24. The old transition regulations contained more specific procedural guidance than do the new PMRT regulations.

25. Lack of specific guidance results in recurring negotiation efforts in successive PMRT Plans.

26. PMDs do not usually provide definitive PMRT guidance.

27. Ineffective control of past transitions appears to have caused some of the transition problems.

28. The PMRT process specifically directs visibility of and tracking for residual tasks.

29. The regulatory guidance for residual tasks does not guarantee task performance.

30. Management functions are interrelated, and the proper application of all the functions could enhance PMRT success.

Comparative Analysis

To facilitate the comparison of transition with PMRT, the general transition problem areas, developed in chapter II, are listed. Following each statement of a transition problem, a discussion of the PMRT process compares PMRT to the transition problem, and indicates if this problem has been resolved through PMRT implementation. After this comparison, additional findings are discussed. Some of these additional findings indicate new problems that have been created by the PMRT process.

1. The transition process lacked specific direction regarding exactly when the process should occur; criteria for transition were vague and subject to individual interpretation. Numerous regulations covering transition provided ambiguous and conflicting guidance. The resultant uncertainty and delays in transition dates hindered planning for other tasks.

PMRT Discussion: Regulations indirectly affecting PMRT are general enough to avoid conflicting with PMRT guidance with the exceptions of AFR 57-4 and AFR 800-12. PMRT criteria for transfer indicate an intent to transfer earlier in the production phase, but the criteria are still broadly stated and subject to interpretation. Establishing the F-4 PMRT date was a controversial process. HQ USAF directed that the F-4 transfer on a date that was earlier than the date recommended by AFSC and AFLC. The PMRT process still lacks a clear objective and does not provide definite criteria for when transfer should take place. However, the single date for PMRT, which is established early and is not easily changed, may facilitate planning for other tasks. If the transfer date

can be agreed to by HQ USAF, AFSC, and AFLC, and if it does not change, tasks such as budgeting and funding, and manpower planning should be more stable and easier to accomplish. The lack of definite criteria for transfer still leaves the possibility of disagreement and delays in establishing transfer dates, and may continue a requirement for HQ AF to arbitrarily establish the transfer date.

2. The transition process resulted in fragmented or divided responsibility between AFSC and AFLC. Some of the reasons for this divided responsibility include:

a. Several different transition agreements and management breakpoints, for different responsibilities, divided program management and led to confusion over specific responsibilities. Engineering responsibility was the last function to transition to AFLC, and resulted in AFSC retaining engineering responsibility after all other responsibilities had transitioned to AFLC.

b. Subsystems that did not meet reliability requirements became exceptions to transition, thus precluding total program transition.

c. Modifications directed to AFSC, after transition, created new AFSC responsibilities.

PMRT Discussion: PMRT regulations specify the requirement for a single transfer agreement and for one date for the transfer of total management responsibility, including engineering responsibility. The PMRT process generally succeeds in eliminating the several transition agreements and in reducing confusion over specific responsibilities, but it does not eliminate the problem of divided responsibility.

The F-4 PMRT Plan, which addressed total program responsibility, had one effective date. However, an AFLC deficiency cut-off date, established to allow time to include AFLC identified deficiencies in the PMRT Plan, added an unplanned breakpoint to the transfer process.

Specific command responsibilities are more clearly defined by the PMRT process. The single transfer agreement facilitates a clear definition of what responsibilities transfer to AFLC. The single transfer date removes confusion over when specific responsibilities transfer to AFLC. Required documentation and tracking of residual tasks, performed by the TWG, also aids in defining responsibilities and removing confusion over task responsibilities after program transfer.

The PMRT process does not resolve the problem of fragmented responsibilities. PMRT directives, the F-4 PMRT Plan, and interview responses all indicate that program responsibility continues to be divided after the transfer process.

Non-transferrable tasks, defined as within the mission jurisdiction of AFSC, do not transfer to AFLC. These tasks are not time limited and, under the present PMRT policy, these tasks will continue to remain an AFSC responsibility indefinitely. Non-transferrable tasks include procurement of major systems, new or continuing engineering development, management of active contracts, budgeting and funding for R&D requirements and major item production, aspects of nuclear weapon programs, production line close down, and any programs directed to AFSC. Thus, the SPO retains a sizeable portion of program management responsibility.

Residual tasks also divide program responsibility between AFSC and AFLC. Residual tasks, like non-transferrable tasks, are defined as within the mission jurisdiction of AFSC.

Residual tasks remain with AFSC until task completion. The F-4 transfer included 21 residual tasks and, two years after the transfer, some of the residual tasks were not completed. New requirements tend to extend completion of residual tasks, and the result is that this area of divided responsibility is prolonged.

PMRT policy specifically includes engineering responsibility, in order to avoid the old transition practice of transitioning engineering responsibility after all other responsibilities had transitioned. However, the research indicates that engineering responsibility continues to be fragmented after a program transfers to AFLC. Performance of non-transferrable tasks and residual tasks requires engineering, and AFSC provides this engineering. AFLC does not possess the engineering capability that is found in AFSC, and AFLC relies on AFSC for many engineering tasks. If AFLC requires engineering support beyond that spelled out in the transfer agreement, AFLC requests this support from AFSC.

3. Interface difficulties and coordination problems resulted from differences in AFSC and AFLC organizational structures and management orientations.

PMRT Discussion: This problem is not caused by the transfer process, but is a result of the management structure within which PMRT must operate. The AFSC and AFLC organizational structures and management orientations have not changed since the implementation of PMRT, and coordination and interface problems still exist. The SPO is the single PMRT approval

agency for AFSC, while HQ AFLC and all affected ALCs approve for AFLC. The F-4 transfer involved coordination with all five ALCs, since each ALC is involved in managing some portion of the F-4 program. The SPO, with a project orientation, possesses almost complete program authority; AFLC is functionally oriented, and no single agency, short of the AFLC Commander, possesses such authority. The SPO has difficulty interfacing with AFLC HQ and with each affected ALC, and coordination problems continue unabated by the new PMRT procedures.

The research findings discussed to this point have been addressed to problems that existed in the old transition process. Additional findings indicate that the PMRT process causes some new problems in program management. Most of these additional findings are associated with PMRT intent to accomplish an earlier program transfer. Other findings involve specific procedures in PMRT regulations, expectations of an early SPO phase out, and lack of enthusiasm for the PMRT process

Research findings indicate that PMRT intent is for an earlier overall program transfer, compared to transition which usually occurred toward the end of the production phase. Common subsystems transfer with the first MDS aircraft, which is also earlier when compared with transition. Engineering responsibility is no longer the last responsibility to be transferred to AFLC. This combination of early transfers creates new problems for AFSC and AFLC.

When the program, and subsystems, transfer earlier, these items are not as well qualified as they would be at a later date. This means that AFLC will probably have to identify and process more deficiencies than would be the case in a later transfer. Most of the deficiencies identified by AFLC are processed and implemented by AFSC, through the active contract. Engineering is usually required to evaluate and implement ECPs, which correct the deficiencies. Thus, early transfer results in an apparent paradox; AFSC processes more AFLC identified ECPs, but the necessary engineering responsibility has supposedly transferred to AFLC.

Practically, early transfer is likely to result in more post-transfer ECPs. However, AFSC does not really transfer all engineering responsibility to AFLC. AFSC retains sufficient engineering expertise to evaluate and contractually implement ECPs.

The attempt to reduce SPO responsibility by providing for an earlier transfer has not, in this case, been successful. SPO responsibility for evaluating and implementing AFLC initiated ECPs has actually increased. To implement these ECPs, the SPO is required to retain some engineering and program management expertise.

Another new problem area associated with PMRT is that the PMRT directives do not contain as much specific procedural guidance as did the old transition regulations. Several

interviewees indicated that the lack of specific procedures in PMRT directives causes extra and recurring work for PMRT negotiators.

Belief that PMRT transfers total responsibility to AFLC appears to have placed pressure on the SPOs for rapid manpower reductions after program transfer. The amount of responsibility that remains with the SPO may preclude rapid SPO reductions. Attempts at premature SPO phase out might result in insufficient manning and expertise to effectively perform the responsibilities that remain with the SPO.

The lack of enthusiasm for the PMRT process may not be a new problem, but seems inconsistent with the dedication and enthusiasm that is evident in program management in general. Any new program might be expected to encounter some resistance, but part of the lack of enthusiasm appears to be a result of the lack of a specific objective for PMRT.

In general, the PMRT process results in a better definition of post-transfer responsibilities and facilitates planning for other tasks. PMRT does not resolve problems of divided responsibility. New problems created by PMRT include paradoxical SPO responsibilities that result from earlier transfer, lack of procedural guidance in PMRT directives, pressure for early SPO phase out, and a lack of enthusiasm for the PMRT process. Overall, the PMRT process appears to have resolved only a few of the transition problems, and many of the problems that plagued the transition process remain unresolved.

This concludes the discussion of research findings. The following chapter summarizes the research effort and uses the findings to draw conclusions and make recommendations.

VII. Summary, Conclusions, and Recommendations

This chapter concludes the thesis by summarizing the research effort and presenting conclusions and recommendations developed in previous chapters. The conclusions and recommendations are numbered for listing sequence only, and do not represent priorities.

Summary

Weapon system acquisition in the Air Force is a multi-billion dollar business, and costs of new weapons are increasing. Efforts to reduce costs are being made in every phase of the acquisition cycle. One area of program management which has recently received attention is the transition of management responsibility for a system from the major acquiring command (AFSC) to the major supporting command (AFLC). In the past, this process has resulted in fragmented program responsibility and confusion over specific responsibilities of the two commands. Program Management Responsibility Transfer (PMRT) was initiated in 1975 to replace the previous transition process and to attempt to resolve transition difficulties.

The purpose of this thesis is to provide a critical analysis of the PMRT process through a study of the F-4 PMRT. The primary objective of the study is to determine if the PMRT process has resolved difficulties encountered in past program transitions. The study is generally limited to the F-4 program and to a single aspect of program management, PMRT. The study includes information from four main sources: 1) background literature,

primarily previous AF studies, 2) AF regulations, 3) the F-4 PMRT Plan, and 4) interviews with people involved in PMRT. This information is used to analyze the PMRT process and to compare PMRT with the previous transition process.

The background chapter traces the evolution of the AF organization in its efforts and procedures used to acquire and support weapon systems. This evolution resulted in the current AF organization, with AFSC and AFLC as major commands sharing the responsibility for managing major weapon system programs. AFSC is basically responsible for research, development, procurement, and production. AFLC is responsible for supply, maintenance, and other logistical support. Program management responsibility transfers from AFSC to AFLC at some point in the acquisition cycle.

Past transitions of program responsibility have encountered difficulties and have created problems in program management. The transition process, used prior to PMRT, included several separate agreements that covered different program responsibilities. The first agreement was a Retrofit Management Breakpoint, which transitioned to AFLC the management and funding responsibility for retrofit changes. A transition agreement was negotiated next, to transition general management responsibility for major program management functional areas. Engineering responsibility was transitioned to AFLC in the final negotiated agreement. Program transition occurred over a period of time, as the separate agreements were negotiated, and created problems in program management, which are discussed next.

In past transitions, the three separate agreements divided the responsibility for program management. This situation caused confusion over which command actually had the responsibility to perform certain tasks. Engineering responsibility was usually the last program management function to transition to AFLC, and resulted in a major division of program responsibility. AFSC, by retaining engineering responsibility, remained actively involved in program management. Several factors combined to prolong the fragmented responsibility. Guidance for when a program should transition was vague, and contributed to delays in the transition process. Exceptions to transition, such as subsystems that did not meet reliability requirements, became residual tasks for AFSC to perform after transition. Different command organizational structures and management orientations caused coordination problems, which further delayed transition. The transition process generally resulted in uncertain and fragmented responsibility, and precluded effective planning in many program functional areas.

PMRT was initiated in an attempt to resolve some of the difficulties associated with transition. PMRT replaced the earlier transition process. The principle distinguishing feature of the PMRT process is that a single transfer agreement is negotiated, and this one agreement covers total program responsibility, including engineering responsibility. The PMRT process establishes one date for transfer of program responsibility to AFLC.

AFR 800-4 and the AFSC/AFLC supplement to AFR 800-4 implemented the PMRT process. A Transfer Working Group negotiates the PMRT agreement. The transfer agreement is coordinated and approved through different channels in AFSC and AFLC. The SPO approves the agreement for AFSC, and AFLC HQ and each affected ALC provide approval for AFLC. The organizational structures and management orientations of the commands appear to continue the coordination problems encountered in the old transition process. Attempts to correct the problem of confusion over command responsibilities include direction for the Transfer Working Group to identify and track residual tasks.

Residual tasks are defined as tasks that fall within the mission statement of AFSC, and tend to continue the problem of fragmented responsibility. Major procurements and developmental efforts are AFSC mission tasks, and are to be performed by AFSC after the program transfers to AFLC. New developments continue long into the operational phase of a system, and AFSC is likely to be managing procurements and new developments long after a program transfers to AFLC.

PMRT criteria for when to transfer a system to AFLC are broadly stated and subject to interpretation. Regulatory guidance states that transfer will take place when a system is operational and no longer requires development engineering. This point in the acquisition phase is not well defined and the criteria still leave room for interpretation and may cause difficulties in negotiating a transfer date.

A review of AF regulations related to the transfer process indicates that some of the regulations have been updated to reflect the PMRT concept. The regulations that have not been updated are general enough to avoid conflicting with PMRT directives, with the exceptions of AFR 57-4 and AFR 800-12. AFR 57-4 directs a Retrofit Management Breakpoint and an Updating Change-Modification Transfer Agreement, which conflicts with PMRT guidance to include these agreements in the PMRT Plan. AFR 800-12 states that support equipment requiring development is the responsibility of the command with management and engineering responsibility, but PMRT guidance directs that AFSC retain responsibility for support equipment requiring development.

In general, PMRT procedures more clearly define and track program responsibility, and seem to advocate a transfer earlier in the production phase. However, PMRT policies still allow numerous areas of divided responsibility. Criteria defining when transfer should take place are still vague and leave room for interpretation and controversy.

The F-4 PMRT provided a useful test case for the new PMRT concept and process. The F-4C, RF-4C, and F-4D had already transitioned to AFLC, and planning was underway for the F-4E, RF-4E, and F-4F transition when PMRT was initiated. AF HQ directed remaining F-4 program transfer under the new PMRT directives, and six months later the program transferred.

The F-4 PMRT Plan covers systems and equipment that had not already transitioned under the old process. The plan,

in accordance with AFR 800-4, includes three sections: Section A covers general provisions, Section B covers specific requirements, and Section C contains and presents the actual transfer agreement.

Section A illustrates a major difference between the earlier transition process and PMRT policies. Transition policy stipulated that subsystems which are common to more than one aircraft model would not transition until the last aircraft model. PMRT policy directs that common subsystems will transfer with the first aircraft model. Section A also introduces a new term, "non-transferrable tasks". Non-transferrable tasks are defined as within the mission jurisdiction of AFSC but, unlike residual tasks, are not time limited.

Section B of the PMRT Plan lists specific requirements in 11 functional areas and specific procedures for transferring these functional responsibilities. Several of the functional area requirements identify responsibilities that remain with AFSC, and indicate that program responsibility will be fragmented between AFSC and AFLC after program transfer.

Section C lists the non-transferrable tasks and the residual tasks, with a proposed schedule for completion of the residual tasks. Non-transferrable tasks include management of active contracts, and budgeting and funding for R&D requirements and major end item production. Residual tasks include 21 specific tasks involving development, procurement, testing, qualification, modification, and support, and are

scheduled to be completed within two years of the transfer date. Post-PMRT tracking of residual tasks indicates that new requirements added to the original residual tasks extend completion times, and some of the residual tasks extended beyond original completion time estimates.

Interview responses presented a general agreement on existing problems in the PMRT process, and also provided suggestions for a variety of recommended solutions to these problems. For identification of problems and treatment of results, the interview responses are grouped according to the management functions of planning, organizing, actuating, and controlling. A digest of findings developed from the responses follows.

PMRT lacks a clearly defined objective, particularly in establishing when transfer should take place. PMRT planning is important to coordinate numerous interests, and to allow adequate time to plan for tasks associated with PMRT. Current AF organization, and AFSC/AFLC mission responsibilities, compound difficulties in the transfer process and preclude total responsibility transfer. Confusion and controversy over when to transfer a program may cause some of the lack of enthusiasm that exists for the PMRT process. A lack of specific direction in PMRT regulations and in Program Management Directives, is perceived as a shortcoming in PMRT policies. The PMRT policy of specifically identifying and tracking residual tasks may result in better control of post-PMRT responsibilities.

Research findings are summarized in chapter VI and are used in a comparative analysis of problems from the old transition process with the provisions of the PMRT process. The findings and the comparative analysis lead to the following sections on conclusions and recommendations.

Conclusions

1. PMRT is a complex process that attempts to integrate many diverse interests into a comprehensive plan.

> Discussion: The PMRT process is difficult to explain and difficult to understand. Almost all areas of program management are involved in and affected by PMRT. A thorough understanding of PMRT requires an understanding of the wide range of functions affected by PMRT and an understanding of complex interrelationships among these functions. Because the process is so complex, the improvements offered by PMRT and continuing efforts to resolve difficulties attribute to the dedication of people involved in program transfer and these individuals are commended for their sincere efforts.

2. The PMRT process more clearly defines the responsibilities of AFSC and AFLC and enhances contingent planning.

> Discussion: The single transfer agreement and one effective date provide a definite point for transfer of program management responsibilities. The required documentation, visibility, and tracking of residual tasks more clearly defines post-PMRT responsibilities. Regulatory guidance for PMRT is less ambiguous than old transition guidance, and only two of the regulations studied provide conflicting guidance. The single transfer date, if it can be established early and is not subsequently changed, will facilitate planning for other tasks associated with PMRT.

3. Program responsibility remains divided between AFSC and AFLC after the PMRT date.

> Discussion: Non-transferrable tasks and residual tasks require that AFSC and the SPO remain involved in program management after transfer. The level of SPO effort

required to perform these tasks precludes an early and rapid SPO phase down. The current major command organizational structures and mission jurisdictions for system acquisition and support require some overlap and fragmented responsibility.

4. An objective of when a program should transfer is not well defined.

Discussion: Criteria for when transfer should take place are broadly stated and leave room for individual interpretation. The AF intent appears to provide for transfer at an earlier point than was prescribed by the old transition process, but this point is not clearly defined. Selection of the date for past transitions and transfers has been a controversial process and PMRT directives allow continuation of this controversy.

5. Interface and coordination problems between AFSC and AFLC are not resolved by the PMRT process.

Discussion: These problems are not caused by the transfer process, but result from the structure within which transfer must take place. This structure has not changed since PMRT was initiated. The SPO is the central approval authority for AFSC. AFLC continues to require coordination and approval from AFLC HQ and each affected ALC for transfer agreements.

6. Problems in PMRT are problems of management.

Discussion: The management functions of planning, organizing, actuating, and controlling are all equally essential for effective program management. Consideration of and judicious application of all the management functions is required to resolve continuing PMRT problems.

Recommendations

1. Study and evaluation of the PMRT process and associated problems should continue.

Discussion: Research into additional alternative solutions should continue. Further research into potentially advantageous organizational and mission changes is warranted. New organizations, such as AFALD and the Propulsion SPO, should be studied to aid in identifying possible solutions to PMRT problems. The PMRT negotiation

process and PMRT Plans for other weapon systems should be studied for implications and reuse of successful experience and avoidance of pitfalls. PMRT problems are complex and interdependent, and may require complex solutions. A systems approach is required in attempts to resolve PMRT problems.

2. The objective of PMRT should be further clarified.

Discussion: AF HQ, AFSC, and AFLC should clarify the intent and expected results of PMRT. If the objective is for an earlier transfer, additional direction is needed to supplement the existing general criteria. If the intent is to allow flexibility in selecting the transfer date, then PMRT regulations should state this intent. Specific guidance on procedures for selecting the PMRTD could reduce or avoid controversy over selection of a transfer date.

3. Attempts should be made to gain working level support for PMRT.

Discussion: Support for the PMRT concept is less than enthusiastic. A clear understanding of the purpose of PMRT could help gain support for transfer policies, and could reduce some of the confusion that still exists in the PMRT process. People working on program transfer may more readily accept the PMRT process if they better understand the purpose and intent of PMRT and if they participate in PMRT planning. Participation by all program management functions is required because of the interdependency of these functions during the PMRT process.

4. The results of current PMRT policies should be recognized and accepted.

Discussion: The fragmented responsibility that results from non-transferrable and residual tasks precludes more rapid reductions in SPO personnel. Pressure to release SPO personnel to work on other tasks causes problems in adequately performing post PMRT tasks. Any attempts to transfer additional responsibilities to AFLC should recognize and consider additional requirements for manning and expertise necessary for AFLC to perform the new responsibilities.

This concludes the research effort. The primary objective of the study has been accomplished by comparing the results under the PMRT process with problems that existed in past transitions. This study provided a valuable learning opportunity for the writer. The writer gained a special appreciation for the complex problems of program management, and gained respect for the many dedicated people who are deeply involved in resolving these problems. Special appreciation is expressed to Dr. Raymond H. Klug, Professor of Management, for guidance and support in this difficult subject area. It is hoped that this study will stimulate continuing interest in program management problems, and that the study will provide useful information for this continuing effort.

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Appendix A

List of Acronyms

AF	Air Force
AFALD	Air Force Acquisition Logistics Division
AFLC	Air Force Logistics Command
AFR	Air Force Regulation
AFSC	Air Force Systems Command
ALC	Air Logistics Center
AMC	Air Material Command
ARDC	Air Research and Development Command
ASD	Aeronautical Systems Division
BMD	Ballistics Missile Division
CCB	Configuration Control Board
DOD	Department of Defense
DPML	Deputy Program Manager for Logistics
DSARC	Defense Systems Acquisition Review Council
DT&E	Development Test and Evaluation
ECP	Engineering Change Proposal
ETP	Engineering Transfer Package
FMS	Foreign Military Sales
HQ	Headquarters
IG	Inspector General
ILS	Integrated Logistics Support
IM	Item Manager
MDS	Mission Design Series
OT&E	Operational Test and Evaluation

PM	Program Manager
PMD	Program Management Directive
PMR	Program Management Responsibility
PMRT	Program Management Responsibility Transfer
PMRTD	Program Management Responsibility Transfer Date
R&D	Research and Development
RMB	Retrofit Management Breakpoint
SAP	Security Assistance Program
SM	System Manager
SPO	System Program Office
TMS	Type Model Series
T.O.	Technical Order
TWG	Transfer Working Group
UC-MTA	Updating Change-Modification Transfer Agreement
US	United States
USAF	United States Air Force
WSPO	Weapon System Program Office

Appendix B

List of People Interviewed

Capt. Ronald R. Anthony: Program Manager, Fighter/Attack SPO, ASD/SD30MS, 1 November 1977.

Mr. Dave Franke: Former Chief of the Ogden ALC Integrated Logistics Support Office for the F-4 Program, now F-16 Depot Program Manager, ASD/YPL, 3 November 1977.

Mr. Louis Hrkman: Logistics Specialist in Directorate of Resources Management, HQ AFLC, AFLC/LOMXX, 20 October 1977.

Mr. William F. Jones: Logistics Management Specialist in Directorate of Aerospace Systems, HQ AFLC, AFLC/LOAP, 18 October 1977.

Lt. Col. Thomas F. Kennedy: Former Chief of Plans and Documentation Branch of Program Control in the F-4 SPO, ASD/SD24, 20 October 1977.

Mr. George C. Kuntz: Chief of Financial Management Division, Fighter/Attack SPO, ASD/SD27, 21 October 1977.

Mr. Dean Nance: Program Analysis Officer, Deputy for Systems, ASD/SDM, 18 October 1977.

Mr. Joseph D. Robinson: Logistics Specialist in Directorate of Resources Management, HQ AFLC, AFLC/LOMXX, 20 October 1977.

Lt. Col. Maynard E. Spotts, Former Configuration Management Officer for F-4 Program, ASD/SD27, 18 October 1977.

Capt. Linda Wyatt: Program Manager for F-16 Logistics Integration, ASD/YPL, 3 November 1977.

Vita

Major Wesley K. Darrell was born in Salt Lake City, Utah in 1943. He graduated from high school in Burley, Idaho in 1962 and from the Air Force Academy in 1966, with a Bachelor of Science degree in Engineering Sciences. After completing pilot training at Williams Air Force Base, Arizona, Major Darrell was assigned to George Air Force Base, California, for training in the F-4C. Subsequent operational F-4 assignments included duty with the Pacific Air Forces and the Tactical Air Command, and he served at Danang Air Base, Republic of Vietnam, Korat Royal Thai Air Base, Thailand, and Eglin Air Force Base, Florida. Major Darrell flew and instructed in the F-4C, F-4D, and F-4E. In 1974, he was assigned to Fort Lewis, Washington as an Air Liaison Officer with the Ninth Infantry Division of the Army. Major Darrell entered the Air Force Institute of Technology, School of Engineering, Graduate Systems Management program in August of 1976. His next assignment will be to the A-10 Systems Program Office.

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The increasing costs of weapon systems have created a demand for more efficient program management. The Air Force organizational structure for acquiring and supporting weapon systems results in two commands sharing this responsibility. The Air Force Systems Command is responsible for research, development, procurement, and production. The Air Force Logistics Command is responsible for supply, maintenance, and other logistical support. Program management responsibility transfers from the Systems Command to

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the Logistics Command at some point in the acquisition cycle. This transition has, in the past, resulted in confusion, duplication, and fragmented responsibility. In an effort to provide for more efficient program management during program transition, the Program Management Responsibility Transfer concept was initiated in 1975. The F-4 program was the first program to transfer under this new concept. The purpose of this study is to provide a critical analysis of the new transfer process through a study of the F-4 transfer. The primary objective is to determine if the new process has resolved difficulties encountered in past program transitions. Research methodology includes analysis of information from four sources in order to compare past transition problems with the new transfer process. Information sources include background literature, Air Force regulations, the F-4 PMRT Plan, and interview responses. Research findings are summarized and used in a comparative analysis of the old transition process and the new transfer process. The study concludes that although the new process more clearly defines the responsibilities of the two commands, many of the past problems, including fragmented responsibility, continue under the new process.