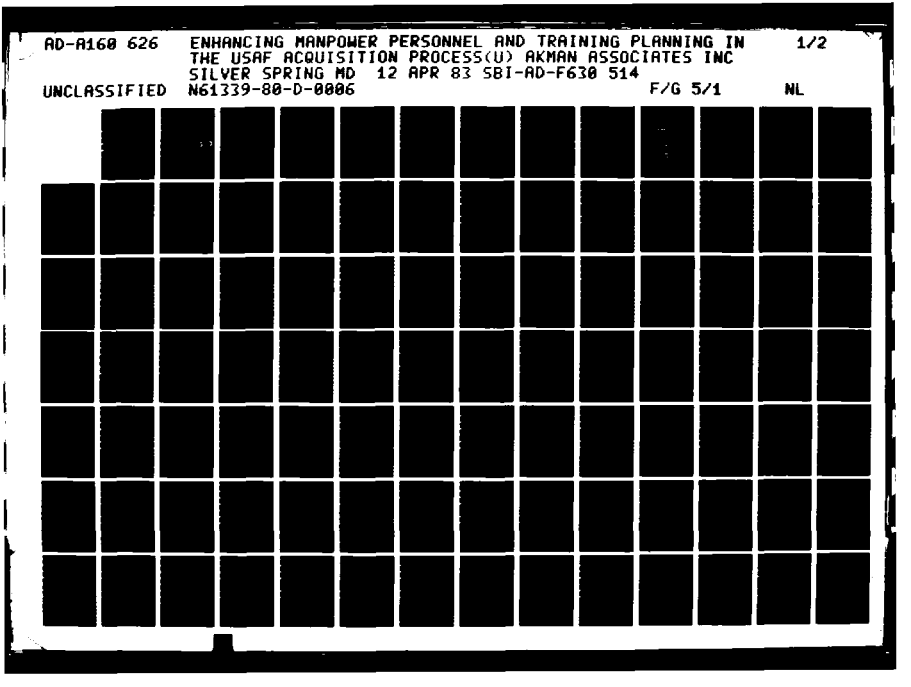
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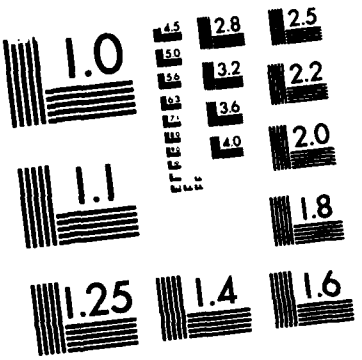

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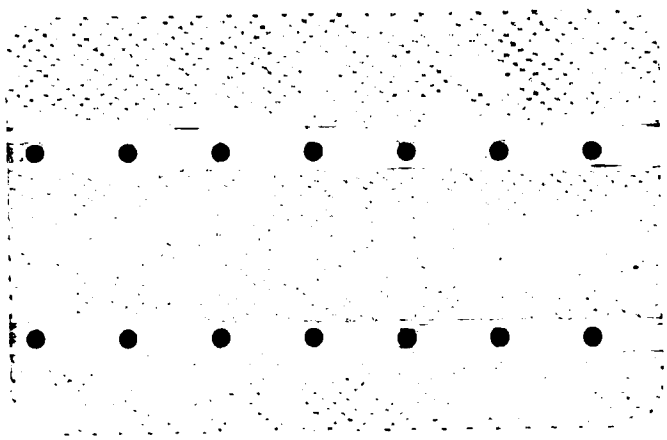

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ENHANCING MANPOWER, PERSONNEL AND TRAINING PLANNING IN THE USAF ACQUISITION PROCESS

FINAL REPORT

12 April 1983

Prepared for:

United States Air Force
Deputy Chief of Staff, Manpower and Personnel
(Long Range Personnel Plans MPXXX)
Washington, D.C.

Under Contract No. N61339-80-D-0006
Delivery Order No. 12

EXECUTIVE SUMMARY

ENHANCING MANPOWER, PERSONNEL AND TRAINING PLANNING IN THE USAF ACQUISITION PROCESS

INTRODUCTION

The Department of Defense has a structured process to be followed in the acquisition of major weapon systems. A central criterion in the choice of alternative weapon systems is the total cost of the system over its economic life, i.e., its life-cycle cost. The cost of operating and maintaining (as opposed to procuring) the weapon system is largely determined by the quantity and skill mix of manpower required for the successful performance of these functions over the life-cycle of the system.

The recent dramatic increase in manpower, personnel, and training (MPT) support costs has illuminated the fact that more attention must be given (and given earlier) in the Weapon System Acquisition Process (WSAP) to identify the manpower requirements and the associated MPT support of new weapon systems. Air Force planners have had a continuing concern about their capability to adequately anticipate the MPT needs associated with new systems, react to those needs, and to influence design decisions while the system is still in the conceptual or design phase. Consistant with this concern is an inability to determine Air Force-wide MPT requirements for all systems under development and an inability to assess the impact of these requirements on the total Air Force structure. In addition, concern for MPT involvement in the WSAP has been expressd by the Government Accounting Office (GAO) (see GAO Report to the Congress, PSAD-81-17, Effectiveness of U.S. Forces Can Be Increased Through Improved Weapon System Design), the Air Force (see Air Force 2000 Report, Chapter 7; Rand Note N-1476-AF, Air Force Manpower, Personnel, and Training System: Volume II; and Rand Report R-2429-AF, Air Force Manpower, Personnel, and Training: Roles and Interactions), the Secretary of Defense (see 25 February 1983 Memorandum for Secretaries of the Military Department concerning the Defense Science Board [DSB] Summer Study on Training and Training Technology), and the Deputy Secretary of Defense (see 1981 Memorandum entitled "Improving The Acquisition Process").

This report consolidates the results of two tasks undertaken by Akman Associates, Inc. (AAI), for the Long Range Plans Branch, Directorate of Personnel Plans, Deputy Chief of Staff, Manpower and Personnel (AF/MPXXX) under Contract No. N61339-80-0006, Delivery Order No. 0012. The first task consisted of an evaluation of the role of MPT in the WSAP, an assessment of the strengths and weaknesses of current policies and practices, and recommendations for enhancements. The second task consisted of developing a detailed concept and an implementation plan for enhancing MPT participation in the WSAP by incorporating increased use of analytical methodologies to assess/project the impact on MPT resources.

FINDINGS

As a result of the evaluation of the role of MPT in the WSAP and the assessment of the strengths and weaknesses of current policies and practices this study found that:

- o MPT requirements are not generally being determined effectively during the early (pre-milestone II) stages of the WSAP.
- o Major components of MPT determination are highly decentralized with no organization responsible for integrating and monitoring system related MPT requirements.
- o The Air Force is unable to aggregate and project the total outyear (post FYDP) manpower requirements necessary to support systems under development and to assess the impact of those requirements on Air Force inventory.
- o There are neither requirements for nor formal methods of timely reporting of system related MPT requirements.
- o There are no effective incentives for either Air Force or contractor personnel to improve MPT determinations during the WSAP.
- o Personnel within the SPO are not generally knowledgeable in MPT determination requirements.
- o MPT considerations are not effectively included in early design tradeoff decisions or in the development of the operational scenarios and maintenance concepts.
- o The Air Force has effective models and methods for individual system MPT determinations; these models and methods are not being optimally exploited.

MPT SUPPORTABILITY CONCEPT

An MPT supportability concept was developed as a result of the assessment of MPT participation in the WSAP. It consists of four major elements:

- o Policies and Procedures;
- o Organization;
- o Analytical Models;
- o Information System.

The basis upon which the entire MPT supportability concept is built is effective policies and reporting procedures. Once the policies and procedures are in place, an appropriate organizational structure can be developed to provide both management oversight of all MPT acquisition-related matters and MPT technical support on the SPO and product division level.

Next, existing and developing Air Force MPT analytical models coupled with newly developed supportability assessment and existing information systems will provide a capability for producing MPT parameters in the early design phase of the acquisition process and the information necessary for effective MPT planning.

Finally, an information system will provide a comprehensive and up-to-date data base of the system-driven MPT requirements of the WSAP.

RECOMMENDATIONS

The following is a list of the nine recommendations developed as a result of this study.

1. Consolidate and Enhance Regulations and Develop Procedures to Enhance MPT Reporting Requirements.

2. Define Requirements for and Establish Organizational Focal Points for Acquisition-Related MPT Matters.

3. Prepare MPT Acquisition Manager's Handbook and MPT Technical Handbook.

4. Provide the SPO with an MPT Analytical Capability.

5. Develop Techniques and Define Requirements to Enhance MPT Participation in the Development of Operational Scenarios and Maintenance Concepts.

6. Determine the Proper Role of AF/MP in Current Contractor Incentive Initiatives.

7. Enhance the Visibility of MPT Requirements in the POM Process.

8. Enhance Transfer of MPT Technology from the Laboratory to the Field.

9. Develop MPT Assessment and Aggregation Capability.

Each recommendation is presented with a statement of need, advantages and disadvantages and results to be expected from implementation.

IMPLEMENTATION PLAN

There are nine tasks included in the implementation plan. They correspond directly to the nine recommendations. Each task is described in a task statement that presents the concept for implementation, the personnel support requirements and the level of effort for implementation.

The estimated level of effort to accomplish the entire implementation plan is approximately 15 manyears (178 manmonths).* This includes 137 manmonths of contractor/Air Force personnel effort and 41 manmonths of Air Force effort. Exhibit A identifies the estimated level of effort for each of the nine implementation tasks.

The implementation effort is expected to extend over a 48-month period with approximately 75 percent of the tasks being completed during the first 21 months. Exhibit B is a Gantt Chart depicting a hypothetical time phasing of each of the nine implementation tasks.

---

*Manmonth is equivalent to 145.2 hours per month available to primary duty, based on a normal work week for CONUS assigned military personnel, as per standard Air Force work week and manhour availability as designated in AFR26-1 (Vol. III).

Exhibit A

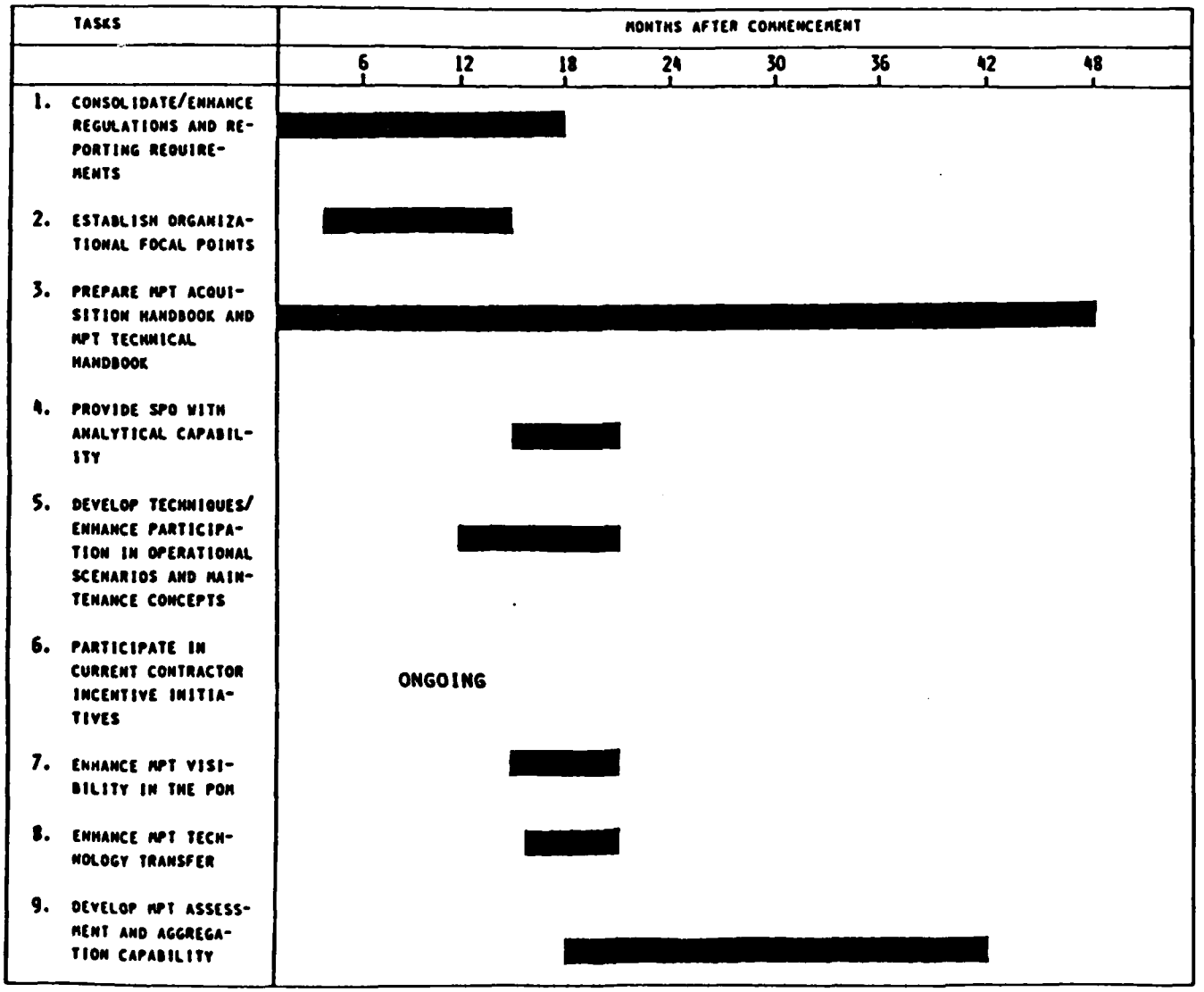
CONSOLIDATED LEVEL OF EFFORT AND TASK DURATION

TASKS	MANMONTHS OF EFFORT		DURATION
	CONTRACTOR OR AIR FORCE	AIR FORCE	MONTHS AFTER COMMENCEMENT
1. CONSOLIDATE/ENHANCE REGULATIONS AND REPORTING REQUIREMENTS	18	6	18
2. ESTABLISH ORGANIZATIONAL FOCAL POINTS	5	4	12
3. PREPARE MPT ACQUISITION HANDBOOK AND MPT TECHNICAL HANDBOOK	66	6	48
4. PROVIDE SPO WITH ANALYTICAL CAPABILITY	2	2	6
5. DEVELOP TECHNIQUES/ ENHANCE PARTICIPATION IN OPERATIONAL SCENARIOS AND MAINTENANCE CONCEPTS	6	2	9
6. PARTICIPATE IN CURRENT CONTRACTOR INCENTIVE INITIATIVES			ONGOING
7. ENHANCE MPT VISIBILITY IN THE POM	1.5	2.5	6
8. ENHANCE MPT TECHNOLOGY TRANSFER	1	2	5
9. DEVELOP MPT ASSESSMENT AND AGGREGATION CAPABILITY	48	15	24
TOTAL	147.5	39.5	48

Exhibit B

IMPLEMENTATION GANTT CHART

Hypothetical Time Phasing of the Nine Implementation Tasks



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LIST OF EXHIBITS

INTRODUCTION

This report is the final report prepared by Akman Associates, Inc. (AAI), for the Long Range Plans Branch, Directorate of Personnel Plans, Deputy Chief of Staff, Manpower and Personnel (AF/MPXXX) under Contract No. 61339-80-D, Delivery Order No. 0012.

This effort consisted of two major tasks. The first task (Report No. 1, 19 January 1983) was to evaluate the role of manpower, personnel, and training (MPT) in the weapon system acquisition process (WSAP); assess the strengths and weaknesses of current policies and practices; and develop recommendations for enhancements. The second task was to develop a detailed concept for assessing the MPT supportability of new systems and to develop a plan for implementing the earlier recommendations. The final report incorporates the results of both efforts.

The report is organized into ten chapters and eleven appendices. The first chapter describes the WSAP as it applies to the Air Force. The second chapter describes the Integrated Logistics Support (ILS) process and its function in MPT planning. Taken together, these two chapters present the policy basis and requirements for MPT participation in the acquisition process.

The next four chapters discuss current practices related to MPT participation in the acquisition process. The third chapter discusses manpower planning. The fourth chapter discusses training planning. The fifth chapter discusses personnel planning. The sixth chapter discusses the effect of the operational scenario and maintenance concept on MPT planning.

Chapter VII presents an explanation of MPT supportability and a discussion of its four component parts. These four component parts form a framework for the development and implementation of an MPT supportability aggregation and assessment capability.

Chapter VIII prersents nine recommendations for enhancing MPT participation in the acquisition process. These nine recommendations form the bases for enhanced MPT participation in the WSAP as well as a basis for developing an Air Force MPT supportability assessment and aggregation capability.

Chapter IX presents an overview of the implementation plan, including estimated levels of effort and resource requirements needed for implementation. Chapter X presents a detailed description of the implementation plan for each of the nine recommendations.

There are eleven appendices associated with this report. The first four appendices present background material useful to readers of this report. The first appendix is a list of abbreviations and acronyms used in this report. The second is a list and synopsis of the applicable instructions and regulations. The third identifies the roles of various Air Staff sections in MPT-related acquisition activities. The fourth appendix is an overview of related activities in other services. The remaining seven appendices present material that supplements the main body of the report.

INTRODUCTION

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CHAPTER I

THE WEAPON SYSTEM ACQUISITION PROCESS IN THE UNITED STATES AIR FORCE

A. Introduction

The purpose of this chapter is to describe the Weapon System Acquisition Process (WSAP) as it functions within the Air Force. This description is presented in two sections. The first section describes the policy basis for the WSAP at both the Department of Defense (DoD) and Air Force levels with emphasis on MPT-related policies. The second section initially describes generic background information concerning the Phases and Milestones of the acquisition process. It then describes the Weapon System Acquisition Process (WSAP) for DoD major programs and Air Force Designated Acquisition Programs (AFDAPs). A flow chart illustrating the documentation flow for the WSAP is presented. Subsequent subsections describe the principal participants and the major documentation involved.

Three major caveats exist in describing the Weapon System Acquisition Process. First, the process is dynamic; it is in a constant state of flux. The directives, instructions and regulations which govern the process are constantly being refined. Second, in accordance with the memorandum entitled "Major Defense System Acquisition Program Documentation Format," April 12, 1982, from the Defense Acquisition Executive (DAE) to the advisors and members of the Defense System Acquisition Review Council (DSARC), a less than formal program review, narrower in scope than the full DSARC, may be held at the call of the DAE. Third, Department of Defense Directive (DoDD) 5000.2 (To Be Issued) stipulates that the Secretary of Defense (SECDEF), upon recommendation of the DAE, may issue a Secretary of Defense Decision Memorandum (SDDM) without a formal DSARC review when there are no substantial issues.

B. Policy Basis

1. Department of Defense

The primary Department of Defense (DoD) policy basis for the WSAP is contained in two directives issued at DoD level:

- DoD Directive 5000.1, Major System Acquisitions, March 29, 1982.
- DoD Instruction 5000.2, Major System Acquisition Procedures (To Be Issued).

DoD Directive 5000.1 is first in the order of precedence for the management of major system acquisitions within DoD. It is considered to have seniority over all other DoD and military component regulations governing major system acquisitions. Except in the case of public law, all conflicts between this directive and other directives are resolved in favor of DoD Directive 5000.1.

DoD Directive 5000.1 establishes the procedures for the acquisition of major systems and describes the phases of the acquisition process. It establishes the milestone review process and describes the actions to be taken at each acquisition milestone. The

DoD Directive 5000.1 also assigns responsibility for the acquisition process to major DoD staff sections, the Secretaries of the Military Departments and the heads of each DoD component. Additionally, it directs that the Defense Systems Acquisition Review Council (DSARC) advise the Secretary of Defense on major system milestone decisions, identifies the DSARC members (see page 19), and designates the Under Secretary of Defense for Research and Engineering (USDRE) as the Defense Acquisition Executive (DAE) and Chairman of the DSARC.

Of particular interest to the Air Force are the following requirements:

- The Secretary of the Air Force, or his designee, shall be a permanent member of the DSARC for major Air Force acquisitions;
- An Air Force acquisition executive shall be appointed to serve as principal advisor to the Secretary of the Air Force;
- An Air Force System Acquisition Review Council (AFSARC) shall be established to advise the Secretary of the Air Force on designated acquisitions;
- A suitable program management structure shall be created for each designated acquisition.

DoD Instruction 5000.2 is second in the order of precedence for the management of major system acquisitions within DoD. This directive establishes the membership of the DSARC and provides detailed instructions as to its requirements and functions.

DoD Instruction 5000.2 identifies permanent advisors to the DSARC and specifies that DSARC reviews normally be held at Milestones I and II. Additionally, it identifies and formats required program documentation including:

- Justification for Major System New Start (JMSNS);
- System Concept Paper (SCP);
- Decision Coordinating Paper (DCP);
- Integrated Program Summary (IPS).

The JMSNS is the document which begins the DoD acquisition process and is the basis for the Milestone 0 decision. The JMSNS identifies mission areas and needs and discusses programmatic characteristics. The JMSNS has limited MPT requirements; when applicable, manpower constraints may be considered as a "key boundary condition" for satisfying the need.

The SCP is prepared for Milestone I review. The DCP is prepared for Milestone II (and III if necessary). Both conceptualize the system, describe alternatives, develop an acquisition strategy and identify known issues. The MPT requirements associated with both documents require specification of projected manning for both operational and maintenance personnel.

The IPS summarizes the DoD component's implementation plan for the complete acquisition cycle. Like the DCP, the IPS is an iterative document with updates and revisions for Milestones II and III. The IPS has a mandatory annex for manpower. Requirements for manpower and training input at each milestone are to be specified in detail.

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There are two additional DoD level documents of importance to MPT analysis and planning in the acquisition process. These are DoD Directive 5000.39, 17 January 1980, Acquisition and Management of Integrated Logistic Support for Systems and Equipment, and Military Standard (MIL-STD)-1388-1A, 25 January 1983, Proposed, Logistic Support Analysis.

DoD Directive 5000.39 establishes policy and responsibility for Integrated Logistic Support (ILS), including manpower planning, as an inherent part of the WSAP. The directive also specifies the manpower-related activities which must be accomplished for each milestone in the acquisition process. These requirements are listed below:

- Milestone 0 - Manpower resource constraints have been identified in the JMSNS. If appropriate, these constraints should be based on an analysis of systems currently in the mission area.

- Milestone I - Manpower implications of alternative operational and support concepts have been evaluated; requirements have been identified and determined to be consistent with updated program constraints. Manpower cost drivers of current systems have been identified and potential improvements established. Manpower parameters critical to system readiness have been identified.

- Milestone II - A consistent set of manpower goals and thresholds have been established and compared to a baseline system. The sensitivity of manpower resource requirements to changes in key parameters and the associated impacts on readiness have been analyzed. Manpower requirements by work center have been identified based on design, support and readiness tradeoff analyses. Requirements for unique skills or specialties which are in short supply have been identified.

- Milestone III - Manpower requirements have been affirmed as meeting goals for peacetime readiness and wartime employment. A preliminary manning document and support analyses (including comparison by work center to a baseline system) are available, and manpower requirements can be met from project assets.

MIL-STD-1388-1A provides a single, uniform approach for use by the military services for conducting and documenting logistic support analysis as part of an ILS program. This document is intended to direct both government agencies and contractors in performing logistic support analysis (LSA). Among the major elements of logistic support is manpower.

MIL-STD-1388-1A establishes the requirement for manpower to be included in logistic support analysis throughout the acquisition cycle. It requires that an analysis of manpower requirements be made and included in the program initiation documents. A determination of manpower demand for both use and support must be made and manpower issues must be considered during LSA program reviews.

MIL-STD-1388-1A, Paragraph 5.3.1 (Task 201), establishes a requirement for conducting manpower supportability assessments. Included in this is an analysis of alternative design and support concepts and their effects on manpower considerations. New and critical skills required due to new design technology or operational concepts must be identified. Sources of required manpower, as well as the impact of failure to obtain the necessary skills, must be identified. Additionally, the manpower demand created by deployment of the new system must be assessed to determine its impact on existing systems. One of the end products of the LSA is to be a complete picture of the manpower requirements of a system from inception through deployment and operation.

2. Air Force

Air Force policy for implementation of the Weapon System Acquisition Process is contained primarily in two regulations:

- AFR 800-2 Acquisition Program Management;
- AFR 57-1 Air Force Operational Requirements and Program Development Process, 12 June 1979.

AFR 800-2 is the principal Air Force document for implementing DoDD 5000.1 and DoDI 5000.2. It applies to all Air Force programs and to joint programs for which the Air Force is designated the lead service. The regulation prescribes the system acquisition process and is applicable from program initiation through deployment. It assigns responsibilities for each command or agency participating in the acquisition process. Responsibilities are assigned according to role in the process rather than by specific agency. Specific responsibilities of the program manager are assigned. The regulation also establishes the Air Force Systems Acquisition Review Council (AFSARC) and designates its membership (see page I-20).

Coincident with AFR 800-2 is Headquarters Operating Instruction (HOI) 800-2, 30 June, 1980, Program Management Direction. It outlines policies and procedures for HQ USAF for initiating and processing documentation giving management direction related to the acquisition process to field commands and agencies. Additionally, it establishes requirements for and specifies the content of the Program Management Directive (PMD). (See page I-26).

AFR 57-1 provides instructions for preparation, submission, assessment and validation of the Statement of Operational Need (SON). (See page 27). This regulation also presents the format for use in preparation of the Mission Element Need Statement (MENS) which was the predecessor of the Justification for Major System New Start (JMSNS) (see page I-26). A Letter of Instruction dated 7 August, 1981 provides guidance for preparation and submission of the SON until AFR 57-1 is revised and reissued.

Appendix A lists Directives, Instructions and Regulations applicable to acquisition-related MPT planning, and also provides a brief synopsis of each.

C. The Weapon System Acquisition Process

1. Background

System acquisitions within the Air Force fall into one of three broad categories: DoD major systems, Air Force Designated Acquisition Programs (AFDAPs), and non-major (other) acquisitions. In general, these categories are differentiated on the basis of cost requirements for development and/or procurement. As an adjunct to cost, the necessary level of program review and approval varies for each category. The cost threshold, review level and approval level for each acquisition designation are shown in Exhibit I-1.

As a general rule, only DoD major systems are subjected to the formal Weapon System Acquisition Process (WSAP). For each DoD major system, ultimate review authority resides with the Defense System Acquisition Review Committee (DSARC), and ultimate approval authority resides with the Secretary of Defense (SECDEF). AFDAPs follow the same process, the only difference being that review and approval are maintained at Air Force level. Air Force Systems Acquisition Review Council (AFSARC) has milestone review authority and the Secretary of the Air Force (SAF) has approval authority. Non-major acquisitions are generally managed by the Air Force as directed by SAF and/or HQ USAF.

The formal WSAP consists of four milestone decision points and four phases of activity. A favorable decision at each milestone constitutes approval for movement into the next phase. AFSARC review and SAF approval are required at each milestone. DSARC review and SECDEF approval are required only at WSAP Milestones I and II. Exhibit I-2 depicts the relationship between Phases and Milestones and identifies the review and decision levels of each Milestone. A fifth phase, the Mission Analysis Phase, has been added prior to Milestone 0 in order to establish continuity. The five phases of the process are:

- Mission Analysis Phase;
- Concept Exploration Phase;
- Demonstration and Validation Phase;
- Full-Scale Development Phase;
- Production and Deployment Phase.

The Milestones are numbered sequentially from 0 through III.

2. Major Weapon System Acquisition Flow Chart

The following pages present a simplified flow chart of the WSAP and attempt to describe the basic steps in the process. It emphasizes documentation and indicates required activities and decision points. The flow chart assumes a constant forward progression from Mission Analysis Phase through Production and Deployment Phase.

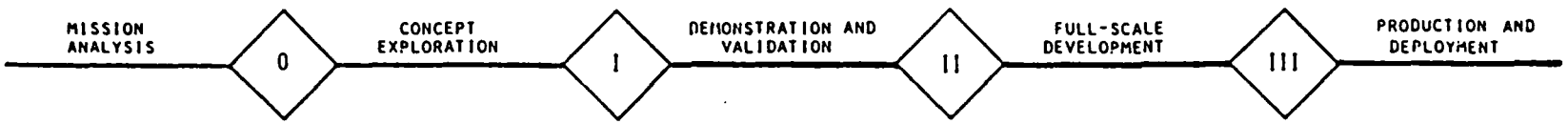
Exhibit I-1

ACQUISITION PROGRAM DESIGNATION

DESIGNATION	THRESHOLD	REVIEW LEVEL	APPROVAL LEVEL
DoD Major	Costs greater than $200 million (FY80 dollars) for RDT&E or $1 billion (FY80 dollars) for procurement/production or both	DSARC	SECDEF
Air Force Designated	Costs greater than $100 million but less than $200 million (FY80 dollars) for RDT&E or greater than $500 million but less than $1 billion (FY80 dollars) for procurement/production or both	AFSARC	SAF
Non Major (Other)	Costs less than $100 million (FY80 dollars) for RDT&E and less than $500 million (FY80 dollars) for procurement/production	AFSARC (If determined by SAF) or Systems Command Assessment Review (SCAR) or SPO Review	SAF (If designated) or Implementing Command or Requirements Review Group

Exhibit I-2

WSAP PHASES AND MILESTONES,
MILESTONE REVIEW AND APPROVAL RESPONSIBILITY



DOD MAJOR					
AF	REVIEW	OSAF	AFSARC	AFSARC	AFSARC
	APPROVAL		SAF	SAF	SAF OR DESIGNEE
OSD	REVIEW	DAE/OSD	DSARC	DSARC	
	APPROVAL		SECDEF	SECDEF	
AFDAP					
AF	REVIEW	OSAF	AFSARC	AFSARC	AFSARC
	APPROVAL		SAF	SAF	SAF OR DESIGNEE
OSD	REVIEW	DAE/OSD			
	APPROVAL				

Mission Analysis Phase

1. Major Commands (MAJCOM) and Separate Operating Agencies (SOA), through routine analysis of mission area, identify an operational need as a result of new threats, new technology, cost reduction opportunity or change in national defense policy. If the operational need cannot be met by existing assets, or if new technology is required which is beyond the authorized resources of the MAJCOM or SOA to fulfill, a "For Comment" Statement of Operational Need (SON) is drafted.

2. The draft SON is staffed among Headquarters, United States Air Force (HQ USAF), Air Force Systems Command (AFSC), Air Force Logistics Command (AFLC), Air Training Command (ATC), Air Force Test and Evaluation Center (AFTEC), and other lateral commands as appropriate, for comment, operational consideration, and programmatic data. If the end-user command will be different from the originating command, justification is included in the draft SON and the end-user is included in the distribution. The draft SON is revised based on this input and recirculated for final comments and for recommendations on ways to address unresolved issues.

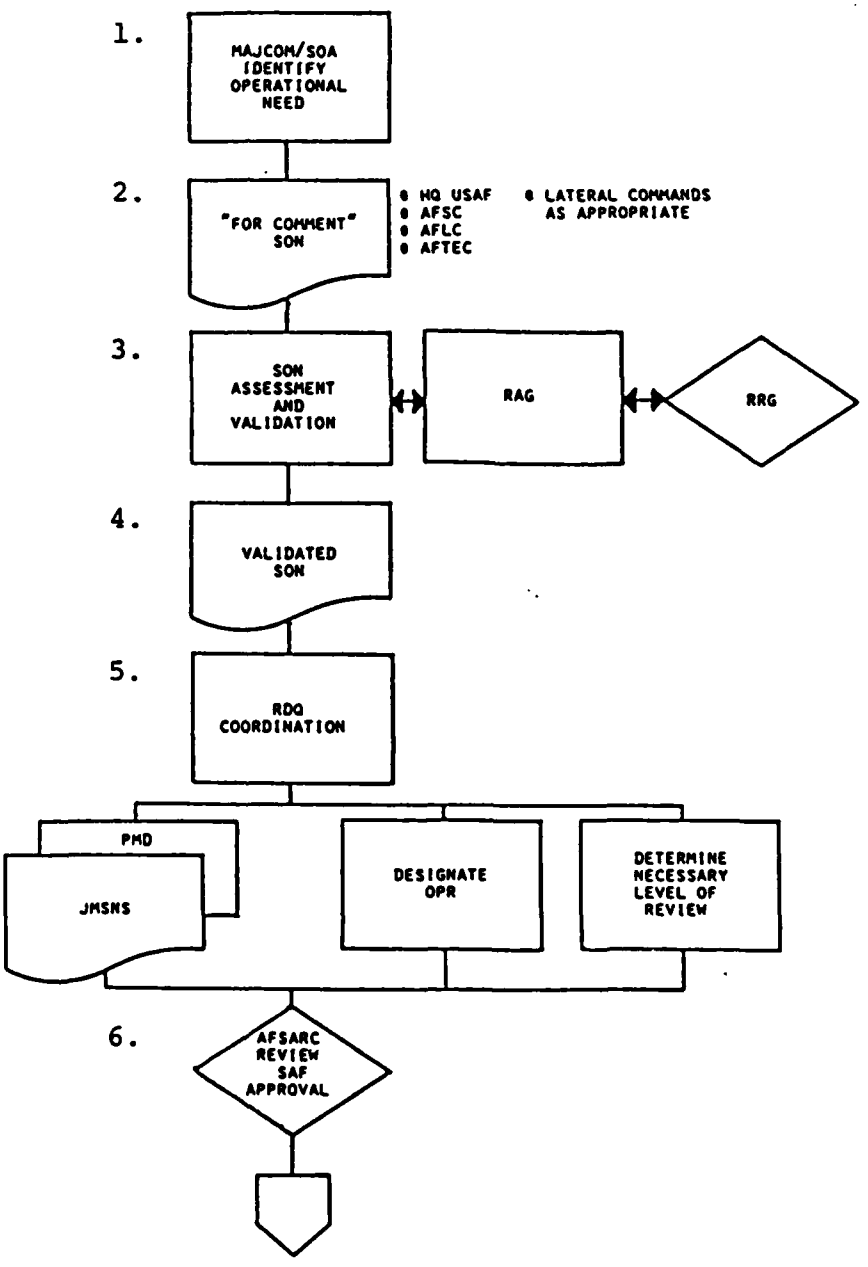
3. Following receipt of final comments, the Directorate of Operational Requirements (AF/RDQ) (which coordinates the SON) schedules an assessment and validation by the Requirements Assessment Group (RAG). The RAG assesses and reviews the SON and provides validation. If issues arise which the RAG cannot resolve, the RAG may request that the Requirements Review Group (RRG) convene to review the issue(s) for resolution. The SON must be validated for the process to continue.

4. The validated SON is the starting point for the development of the Justification for Major System New Starts (JMSNS).

5. AF/RDQM coordinates the issuing of the Program Management Directive (PMD), designating an Office of Primary Responsibility (OPR), determining the level of review and approval necessary for the program, and drafting the JMSNS. The JMSNS requires in-house Planning, Programming and Budget System (PPBS) funds competition, a program initiation Program Management Directive (PMD) and Budget Authorization/Program Authorization.

6. The Office of the Secretary of the Air Force (OSAF) reviews the JMSNS and forwards it for Defense Acquisition Executive's (DAE) review and validation.

MISSION ANALYSIS PHASE



Milestone 0

7. The validated JMSNS is the basis of Milestone 0 (Mission Need Determination).

8. The JMSNS is submitted to the Secretary of Defense (SECDEF) as a line item in the Air Force Program Objectives Memorandum (AFPOM). The POM requests funds for the budget year as part of the Department of Defense's (DoD) PPBS.

9. SECDEF endorsement of the acquisition is implicit in approval of the AFPOM as part of the PPBS. SECDEF issues a Program Decision Memorandum (PDM) which provides appropriate program guidance. If the program is a multi-DoD component acquisition, SECDEF issues a Secretary of Defense Decision Memorandum (SDDM) in which lead component determination is made.

Concept Exploration Phase

10. HQ USAF, through OPR initiates the Concept Exploration Phase by formally designating an implementing command and by issuing the PMD and BA/PA.

11. Implementing command appoints a Program Manager (PM) and establishes a System Program Office (SPO) with support input from other participating commands.

12. As the Concept Exploration Phase progresses, recommendations for the Demonstration and Validation Phase are compiled by the SPO and included in the Phase Review Package (PRP), which when complete is submitted by HQ USAF.

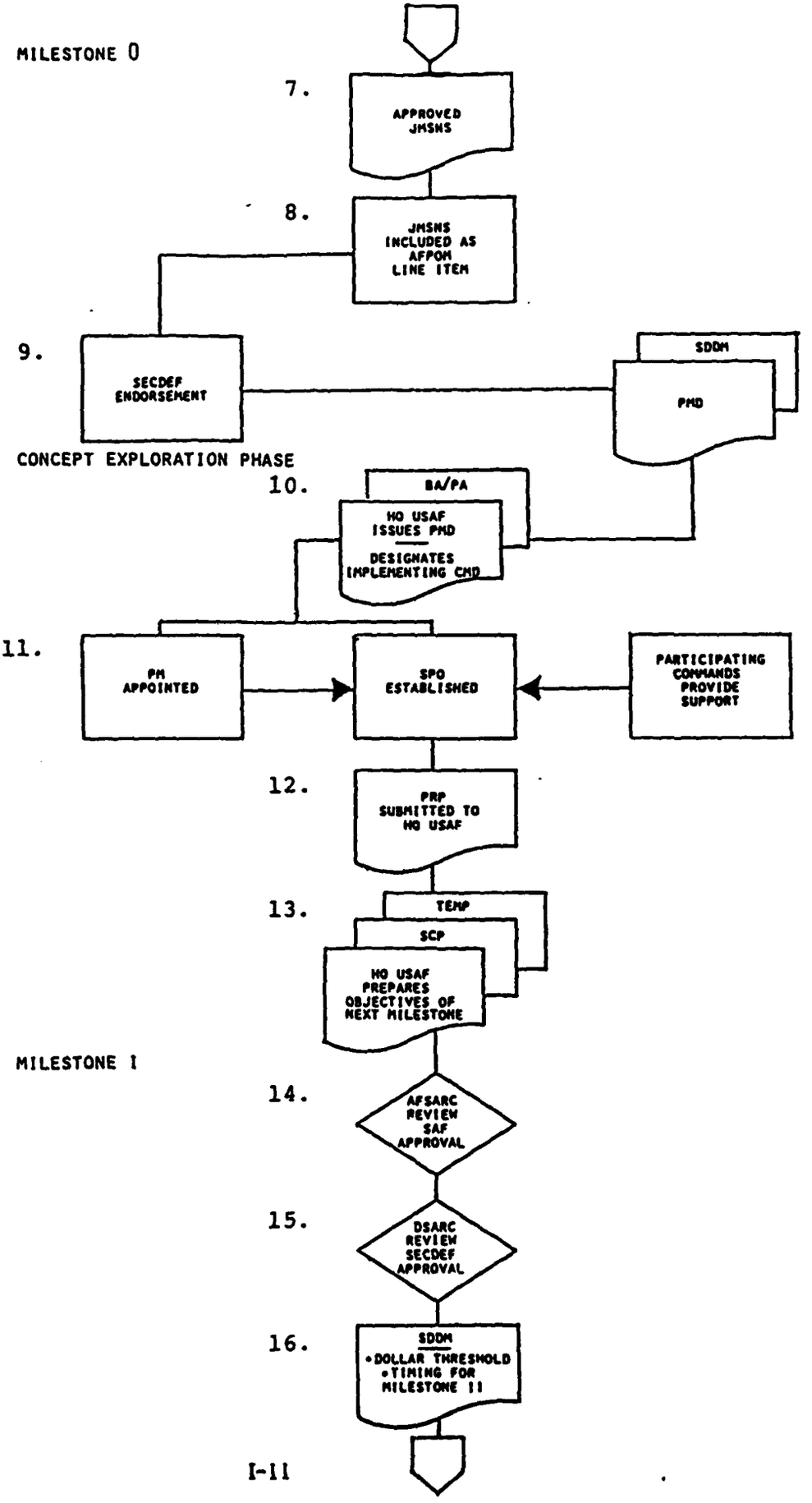
13. HQ USAF, based on the PRP, prepares a System Concept Paper (SCP), a Test and Evaluation Master Plan (TEMP) and determines the objectives of the next milestone.

Milestone I

14. The SCP, including the TEMP, is the basis for Milestone I review and approval. AFSARC I reviews the SCP and recommends action for SAF approval.

15. SAF forwards the SCP for DSARC I review and SECDEF approval. The DAE, as chairman of the DSARC, may also convene the RAG and RRG in order to resolve outstanding issues before making his recommendations to SECDEF.

16. SECDEF's decision is documented in the SDDM. SECDEF also issues a "Not to Exceed" dollar threshold, and establishes the timing for accomplishment of Milestone II.


MILESTONE 0
7.
APPROVED JMSNS
8.
JMSNS INCLUDED AS AFPOM LINE ITEM
9.
SECDEF ENDORSEMENT
SDDM
PMD
CONCEPT EXPLORATION PHASE
10.
BA/PA
HQ USAF ISSUES PMD
DESIGNATES IMPLEMENTING CMD
11.
PM APPOINTED
SPO ESTABLISHED
PARTICIPATING COMMANDS PROVIDE SUPPORT
12.
PRP SUBMITTED TO HQ USAF
13.
TEMP
SCP
HQ USAF PREPARES OBJECTIVES OF NEXT MILESTONE
MILESTONE I
14.
AFSARC REVIEW SAF APPROVAL
15.
DSARC REVIEW SECDEF APPROVAL
16.
SDDM
•DOLLAR THRESHOLD
•TIMING FOR MILESTONE II

Demonstration and Validation Phase

17. HQ USAF, through OPR, initiates the Demonstration and Validation Phase by revising the PMD to reflect the SDDM and by updating the BA/PA.

18. The Program Manager (PM) and SPO, in coordination with the implementing, supporting and other participating commands, assess and evaluate alternatives.

19. The PM and SPO develop an acquisition strategy for selected alternative(s) and prepare the Program Management Plan (PMP) to provide an economical, effective and efficient approach to achieving the program's objectives.

20. The PM and SPO coordinate the development of program documentation and the production, testing and evaluation of the prototype(s).

21. As work progresses during this phase, all program documentation must be included in the PMP. This includes the updated SON, Preliminary System Operational Concept/System Operational Concept (PSOC/SOC), Integrated Support Plan (ISP), Integrated Logistics Support Plan (ILSP), Test and Evaluation Master Plan (TEMP), and the Decision Coordinating Paper (DCP).

    A prototype of the acquisition is usually developed as a result of a design competition. The prototype is constructed in accordance with the PMP. Test and Evaluation of the prototype is conducted by the Air Force Test and Evaluation Center.

22. As a result of demonstration and validation, and based on the complete documentation, the SPO drafts a full-scale development plan for submission to HQ USAF.

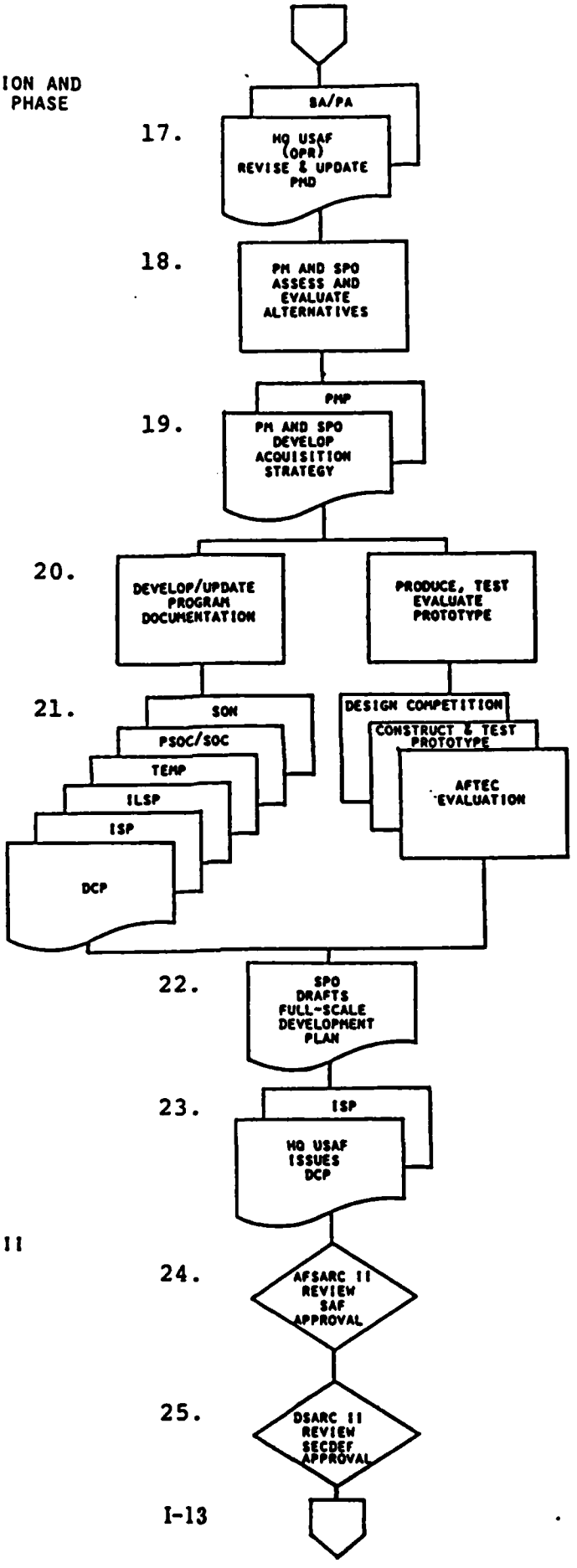
23. HQ USAF issues the DCP and an Integrated Program Summary (IPS) based on the full-scale development plan and the documentation provided by the SPO.

Milestone II

24. The DCP and IPS are the basis for Milestone II review and approval. AFSARC II reviews the program and recommends action for SAF approval.

25. SAF forwards the DCP and IPS for DSARC II review and SECDEF approval. The DAE, as chairman of the DSARC, may also convene the RAG and RRG in order to resolve outstanding issues before making recommendations to SECDEF.

DEMONSTRATION AND VALIDATION PHASE



26. SECDEF's decision is documented in the SDDM.

Full-Scale Development Phase

27. HQ USAF, through OPR, initiates the Full-Scale Development Phase by issuing the updated PDM and BA/PA as indicated by the SDDM.

28. The PM and SPO revise and update the PMP to coordinate the full-scale development effort.

29. The PM and SPO coordinate the development of program documentation and the production of the full-scale prototype.

30. As work progresses during this phase, the program documentation is updated. This includes the SON, the ILSP (into which the SOC is integrated), the ISP and the DCP.

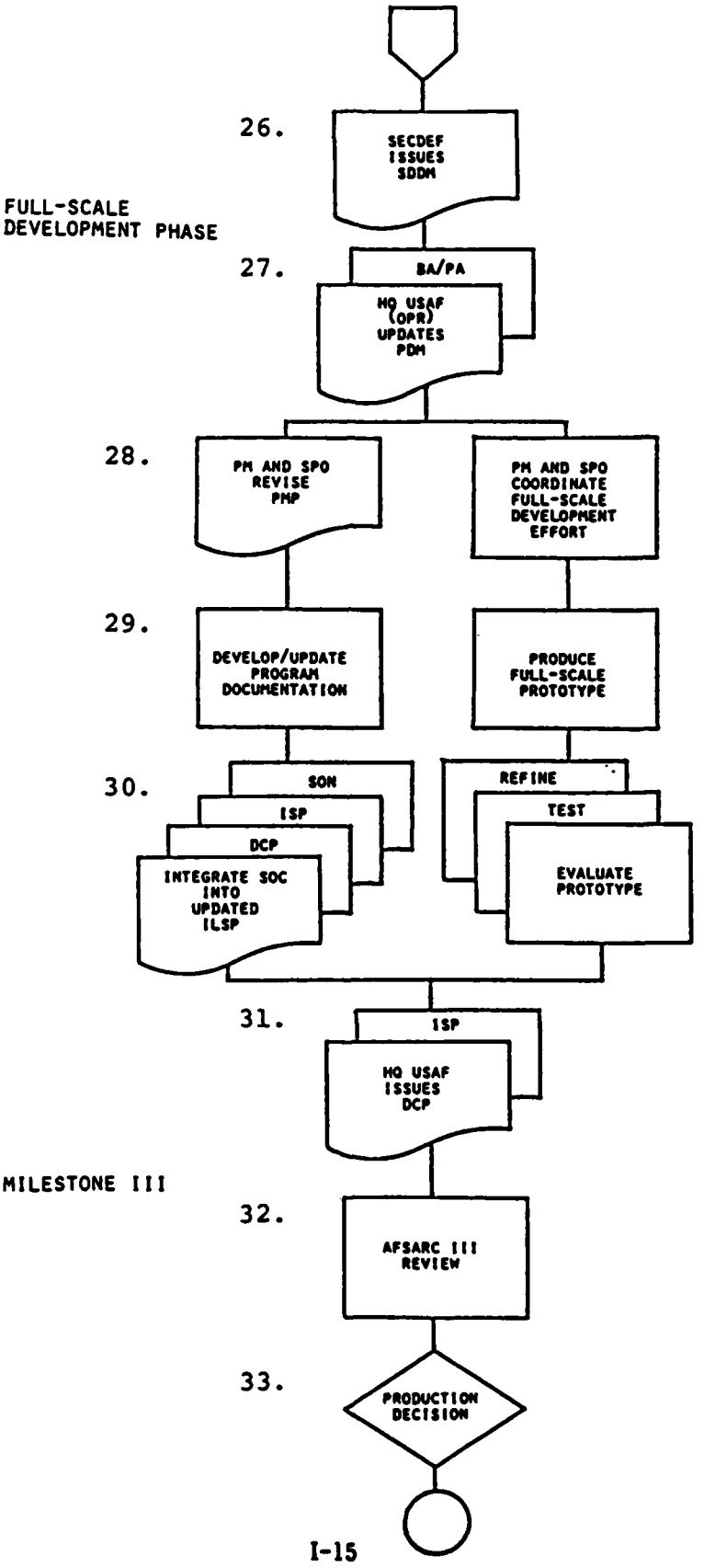
    The production prototype of the acquisition is refined in accordance with the PMP. Test and evaluation is conducted by AFTEC.

31. As a result of the full-scale development phase and based on the complete documentation developed by the SPO, HQ USAF issues a DCP and IPS.

Milestone III

32. The DCP and IPS, in conjunction with production and deployment plans developed by the user command and other supporting commands, are the basis for Milestone III review. AFSARC III reviews the program and recommends that production begin.

33. The production decision is delegated to the SECAF, provided the program objectives and thresholds established at Milestone II and recorded in the DCP and ISP have not been exceeded. SECAF may delegate decision authority to the lowest level at which a comprehensive view of the program rests. If the thresholds established at Milestone II are exceeded, a DSARC III review may be convened. If this occurs, a revised DCP and ISP are prepared which describe the changes since Milestone II and which establish new thresholds.


26.
SECDEF ISSUES SDDM
FULL-SCALE DEVELOPMENT PHASE
27.
BA/PA
HQ USAF (OPR) UPDATES PDM
28.
PM AND SPO REVISE PMP
PM AND SPO COORDINATE FULL-SCALE DEVELOPMENT EFFORT
29.
DEVELOP/UPDATE PROGRAM DOCUMENTATION
PRODUCE FULL-SCALE PROTOTYPE
30.
SON
ISP
DCP
INTEGRATE SOC INTO UPDATED ILSP
REFINE
TEST
EVALUATE PROTOTYPE
31.
ISP
HQ USAF ISSUES DCP
MILESTONE III
32.
AFSARC III REVIEW
33.
PRODUCTION DECISION

3. Principal Participants

With the exception of HQ USAF, the Air Training Command (ATC) and the Air Force Test and Evaluation Center (AFTEC), responsibilities in the acquisition process are defined in terms of roles rather than specific commands or agencies. However, some generalities may be safely made. The implementing command will generally be Air Force Systems Command (AFSC); the supporting command will generally be the Air Force Logistics Command (AFLC); the operating command will generally be one of the Air Force Major Commands (MAJCOMs).

Principal participants in the Weapon System Acquisition Process also include:

- Program Manager (PM);
- Defense Acquisition Executive (DAE);
- Defense Systems Acquisition Review Council (DSARC);
- Air Force Systems Acquisition Review Council (AFSARC);
- Requirements Advisory Group (RAG);
- Requirements Review Group (RRG).

a. HQ USAF

HQ USAF is responsible for defining and providing directions and guidance, and designating the implementing and the participating commands in the Program Management Directive (PMD). HQ USAF establishes review and approval requirements, program constraints, thresholds and operational standards, and designates the Source Selection Authority. HQ USAF prepares the JMSNS, the Budget Authorization (BA), the Program Authorization (PA), and coordinates the Decision Coordination Paper (DCP), System Concept Paper (SCP) and Integrated Program Summary (IPS). A listing of the roles of the various HQ USAF staff sections involved in acquisition-related MPT activities is contained in Appendix B.

b. Implementing Command

The implementing command or agency is responsible for achieving the program objectives. It insures that tasks defined in the PMD are performed and that necessary supplements to the PMD are issued. The implementing command appoints a Program Manager (PM), establishes a System Program Office (SPO) and delegates program management authority and responsibility to the PM through the program manager's charter. The implementing command identifies and evaluates alternative system design concepts and prepares the Phase Review Package (PRP) for HQ USAF. The implementing command also carries out each phase as directed, coordinates tradeoffs, and prepares or integrates all participating command documents required for the milestone review.

c. Supporting Command

The supporting command is responsible for providing integrated logistic support considerations (including availability, maintainability, reliability, safety, life cycle cost, survivability, logistics supportability and human factors) for all SONs, PSOCs and SOCs. It is responsible for assisting the PM in planning and conducting the Integrated Logistic

Support Program in accordance with the PMD. It designates an experienced logistician as Deputy Program Manager for Logistics (DPLM), develops logistics support alternatives and assesses supportability and affordability considerations. The supporting command also plans for transfer of program management responsibility during the production phase.

d. Air Training Command

ATC is responsible for maintenance training support. It provides information used to estimate training costs and training resource requirements used in training planning for all draft SONs, PSOCs and SOCs. ATC supports the program by developing training concepts, identifying requirements and developing implementation plans. ATC also assesses costs and risks associated with training alternatives, determines milestone schedules for the development of planned training capabilities, takes part in test and evaluation, and evaluates training systems logistics supportability.

e. Air Force Test and Evaluation Center

AFTEC is responsible for developing policies for and managing the independent Operational Test and Evaluation (OT&E) Program. AFTEC reviews and comments on SONs, PSOCs and SOCs. It provides OT&E planning inputs to the System Program Office in accordance with the PMD. AFTEC recommends the extent of involvement of the supporting and operating commands in OT&E programs, and based on the SOC, plans and conducts OT&E. AFTEC also provides applicable OT&E data to the operating and supporting commands as well as to DSARC and AFSARC.

f. Operating Command

The operating command is responsible for operating a system, subsystem or item of equipment. It initiates the acquisition process by drafting the Statement of Operational Need (SON). The operating command is responsible for developing a Preliminary System Operational Concept (PSOC) for each proposed alternative solution concept to be recommended for Milestone I review. It is also responsible for expanding the PSOC into a System Operational Concept (SOC) for each program recommended for Milestone II review. The operating command is also responsible for operational and maintenance concepts, plans and requirements prior to each milestone review.

g. Program Manager

The Program Manager (PM) is responsible for the overall management of the acquisition program in accordance with the PMD and applicable AFRs. The PM is usually appointed by the implementing command. He prepares and issues a Program Management Plan (PMP) and provides for communication and coordination with all participating commands. The PM is responsible for consolidating and issuing all program documentation, including the Program Review Package (PRP), Integrated Logistics Support Plan (ILSP), and Integrated Support Plan (ISP). The PM assesses the program's progress against its objectives, constraints, and thresholds and conducts tradeoffs, including manpower considerations. The PM is responsible for making planning and programming inputs to participating commands to identify funding needs of the acquisition program. The PM is also responsible for managing the Integrated Logistics Support (ILS) program and for planning the transfer of program management responsibility during the production phase. (See Chapter II for a detailed description of the ILS process).

h. Defense Acquisition Executive

The Defense Acquisition Executive (DAE) is the principal adviser and staff assistant to the Secretary of Defense on the acquisition of defense systems and equipment. The Under Secretary of Defense for Research and Engineering (USDRE) is designated as the DAE. The USDRE is responsible for review and validation of the JMSNS and for integrating of the acquisition process and the PPBS. The DAE monitors compliance with Office of Management and Budget (OMB) policies, with DoD Directives and Instructions, and resolves conflicts between DoD issuances concerning the acquisition process. The DAE is responsible for designating acquisition programs as major systems and is also authorized to withdraw that designation when circumstances so dictate. The DAE is chairman of the Defense System Acquisition Review Council (DSARC). The DAE conducts appropriate milestone and program reviews and may convene the Requirements Assessment Group (RAG) and the Requirements Review Group (RRG) when necessary as part of the review process. The DAE appoints the DSARC Permanent Executive Secretary and also appoints an Action Officer to be the lead OSD staff official in the DSARC process for each major system.

i. Defense System Acquisition Review Council

The Defense System Acquisition Review Council (DSARC) is responsible for advising the Secretary of Defense (SECDEF) on Milestone I and II decisions for major systems and such other acquisitions as the DAE determines necessary. Permanent membership in the DSARC is established in DoD Directive 5000.1, and Permanent Advisers are established in 5000.2. The composition of the DSARC is shown in Exhibit I-3. DSARC reviews for major systems are normally held at Milestones I and II. If thresholds established at Milestone II are breached, another DSARC review may be convened by the DAE at Milestone III. Draft documentation is submitted by DoD components to the DSARC members three months before the DSARC meeting and comments are returned by DSARC members to DoD components two months before the DSARC meeting. Final updates are submitted three weeks before the meeting. Component staff briefings to OSD are conducted at least three weeks prior to the DSARC meeting. OSD staff reports and briefings to DSARC members are presented at least six work days before the DSARC meeting. At the DSARC meeting DoD components are responsible for addressing issues and providing additional information as needed; OSD staff presents reports and discusses unresolved issues. All DSARC recommendations to be made to the Secretary of Defense are made in executive session.

j. Air Force System Acquisition Review Council

The Air Force System Acquisition Review Council (AFSARC) is responsible for advising the Secretary of the Air Force (SAF) on all Milestone decisions for both major system acquisitions and Air Force Designated Acquisition Programs (AFDAPs). Secretary of the Air Force Order 20.6, 26 June 1976, establishes the AFSARC as a forum for the review of major acquisition programs and AFDAPs. The membership of the AFSARC is established in AFR 800-2. The composition of the AFSARC is shown in Exhibit I-4. The Assistant Secretary of the Air Force for Research, Development and Logistics (ASAFRD&L) is designated by the SAF as the Air Force Acquisition Executive (AFAE). Unresolved issues proceeding toward an AFSARC review are presented to the AFSARC Assessment Committee (AAC) and proper Air Staff Board Structure level to identify alternatives. All program alternatives that are consistent with the PPBS and Five Year Defense Program/Extended Planning Annex (FYDP/EPA) must be submitted for Milestone I, II and III reviews by the AFSARC.

Exhibit I-3

DEFENSE SYSTEM ACQUISITION REVIEW COUNCIL (DSARC)

Permanent Members

Under Secretary of Defense for Research and Engineering (USDRE) - Chairman and DAE
Under Secretary of Defense for Policy (USDP)
Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) (ASD(MRA&L))
Assistant Secretary of Defense (Comptroller) (ASDC)
The Director, Program Analysis and Evaluation (DPA&E)
The Chairman, Joint Chiefs of Staff (CJCS), or designee
Service Secretaries, or designees

Permanent Advisors

Deputy Under Secretary of Defense (Strategic or Theater Nuclear Forces)
Deputy Under Secretary of Defense (Communications, Command, Control and Intelligence) (DSD (C3I))
Deputy Under Secretary of Defense (Acquisition Management)
The Director, Defense Test and Evaluation (DDT&E)
The Director, Defense Intelligence Agency (DDIA)
The Director, Weapons Support Improvement Group (DWSIG)
The Chairman, Cost Analysis Improvement Group (CAIG)

Ad Hoc Advisors

As requested by DAE

Exhibit I-4

AIR FORCE SYSTEMS ACQUISITION REVIEW COUNCIL (AFSARC)

Permanent Members

Assistant Secretary of the Air Force of Research, Development and Logistics (SAFAL) - Chairman and AFAE
Assistant Secretary of the Air Force for Financial Management (SAFFM)
Assistant Secretary of the Air Force for Manpower, Reserve Affairs and Installations (SAFMI)
Vice Chief of Staff (CV)
Deputy Chief of Staff, Research, Development and Acquisition (AF/RD)
Deputy Chief of Staff, Programs and Resources (AF/PR)
Deputy Chief of Staff, Plans and Operations (AF/XO)
Deputy Chief of Staff, Logistics and Engineering (AF/LE)
Deputy Chief of Staff, Manpower and Personnel (AF/MP)
Comptroller of the Air Force (AF/CV)

Advisors

General Council Department of Air Force (SAFGC)
Assistant Chief of Staff for Studies and Analyses (AF/SA)
Air Force Test and Evaluation Center (AFTEC)

k. Requirements Assessment Group

The Requirements Assessment Group (RAG) is responsible for assessment and validation of the Statement of Operational Need (SON). Air Force Regulation 57-1, with letter of instruction dated 27 August 1981, establishes the membership of the RAG. The composition of the RAG is shown in Exhibit I-5. The RAG convenes formally on a year-round basis and may be convened at the call of the DAE. The recommendations of the RAG reflect a consensus of the membership, and a Record of Proceedings documents the RAG recommendations to the members of the Requirements Review Group (RRG). Recommendations of the RAG fall into three categories: Unconditional validation indicates that the SON may be entered in the next annual POM; Conditional validation indicates that if the SON is funded it must be revised and validated to assure that requirement and program are compatible prior to acquisition; Not validated indicates that the SON should not proceed due to insufficient justification or unresolved key issues.

l. Requirements Review Group

The Requirements Review Group (RRG) is the HQ USAF general officer review board responsible for review and recommendations of operational need validity before commitment of significant resources to solution programs. Air Force Regulation 57-1, with letter of instruction dated 27 August 1981, establishes the membership of the RRG. The composition of the RRG is shown in Exhibit I-6. The RRG reviews the recommendations of the RAG. Full coordination of the RAG's Record of Proceedings by the members of the RRG constitutes enactment (decision) of the recommendations. AF/RDQ may convene the RRG to resolve issues not resolved by the RAG or to resolve issues which arise during the RRG coordination of the Record. The DAE may also convene the RRG in order to resolve issues that arise as a result of milestone reviews of DoD major systems.

Exhibit I-5

REQUIREMENTS ASSESSMENT GROUP (RAG)

Primary Members	Ad Hoc Members
AF/RDQM (co-chairman)	AF/XOEX
AF/XOOI (co-chairman)	AF/XOSX
AF/XOKJ	AF/RDP
AF/XOXF	AF/RDSD
AF/LEYY	AF/LEEV
AF/LEXM	AF/ACDM
AF/INEG	AF/SGES
AF/INYX	AF/IGF
AF/MPXXX	
AF/PRPF	
NGB/XOO	

Exhibit I-6

REQUIREMENTS REVIEW GROUP (RRG)

Director of Operational Requirements (AF/RDQ) - (Chairman)
Director of Operations (AF/XOO)
Director of Plans (AF/XOX)
Director of Command and Control and Telecommunications (AF/XOK)
Director of Electronic Combat (AF/XOE)
Director of Space (AF/XOS)
Director of Development and Production (AF/RDP)
Director of Programs and Evaluation (AF/PRP)
Director of Logistics Plans and Programs (AF/LEX)
Director of Maintenance and Supply (AF/LEY)
Director of Engineering and Services (AF/LEE)
Director of Computer Resources (AF/ACD)
Assistant Chief of Staff for Intelligence (AF/IN)

4. Major Documentation

As indicated in the preceding description of the WSAP, there are numerous pieces of documentation developed to support the various phases of the DoD major and AFDAP acquisition process. Exhibit I-7 illustrates major documentation vis-a-vis the WSAP Phases and Milestones. The major documents described in this subsection are all iterative documents, that is they are constantly reviewed and revised as the program progresses.

a. Air Force Program Objectives Memorandum (AFPOM)

The AFPOM is used to develop programs which translate approved concepts and objectives into requirements and to provide an orderly basis for obtaining force and weapon systems objectives and their logistic support. SECDEF decisions on the AF POM become key guidance to the Chief of Staff and are essential elements of budget building. The goal of the AFPOM is to develop a Five-Year Defense Plan (FYDP) for the Air Force. It is developed within the fiscal guidance constraints which are imposed by the SECDEF. The role of the AFPOM in the WSAP is to present the Justification for Major System New Starts (JMSNS) for SECDEF consideration at Milestone 0 as a line item in DoD Planning, Programming and Budgeting System.

b. Decision Coordinating Paper (DCP)

The DCP (in conjunction with the IPS) is used to provide primary documentation for use by the AFSARC and DSARC at Milestone II and III reviews. It summarizes the program acquisition strategy, the alternatives considered, and the issues affecting the milestone decision. It references supporting documentation and is not to exceed eighteen (18) pages excluding annexes for Program Structure, Thresholds, and Resources.

c. Integrated Logistics Support Plan (ILSP)

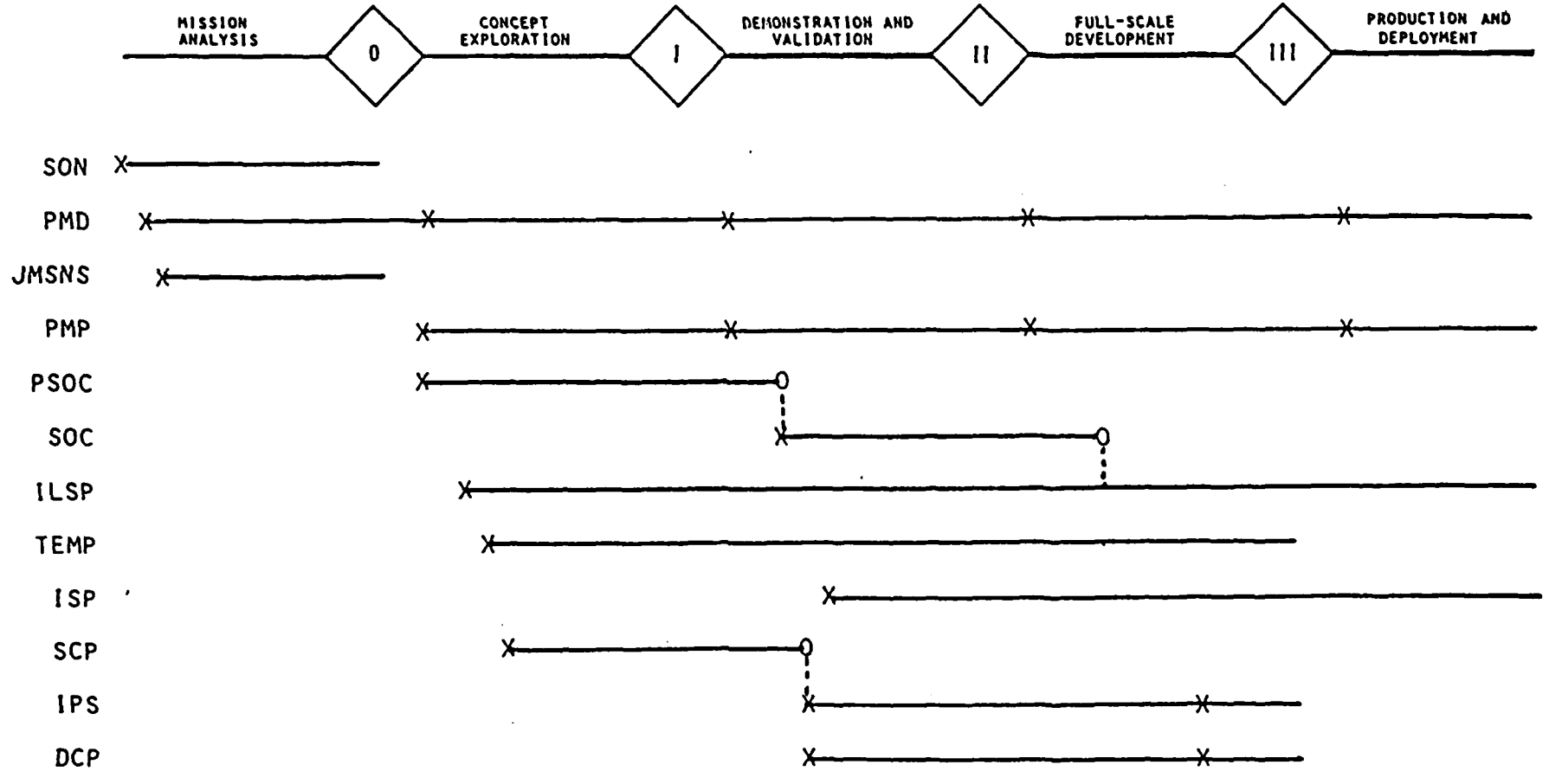
The ILSP is an iterative document used by the Program Manager, Deputy Program Manager for Logistics (DPML) and Integrated Logistics Support Manager (ILSM) to fully integrate all ILS elements with the mission elements of a system throughout its life cycle. The ILSP is part of the Program Management Plan (PMP) and, when approved, becomes directive on all commands and agencies participating in the WSAP. The ILSP begins as a broad objective-oriented document in the Concept Exploration Phase and becomes a more specific tasking and milestone review document as the program progresses through the WSAP. The ILSP is reviewed and updated whenever new program direction is received (at milestone reviews) or when changes occur that warrant logistic support planning realignment.

d. Integrated Program Summary (IPS)

The IPS (in conjunction with the DCP) is used to provide primary documentation for use by AFSARC and DSARC at Milestone II and III reviews. It summarizes the Air Force implementation plan for the complete acquisition cycle with emphasis on the phase the program is entering and provides a management overview of the entire program. It references supporting documentation and is not to exceed sixty (60) pages including annexes for cost, funding, manpower and logistics.

Exhibit I-7

MAJOR DOCUMENTATION IN THE WSAP PROCESS



X = DRAFT OR UPDATE

O = INTEGRATE INTO OTHER DOCUMENT AS CONNECTED

e. Integrated Support Plan (ISP)

The ISP is an iterative document prepared by a contractor for the acceptance and approval of the acquisition program. It describes the contractor's plan for managing contractual integrated logistic support (ILS) program, for complying with ILS requirements and for planning operational support functions in support of the acquisition. The ISP is part of the documentation that comprises the Program Management Plan (PMP). It is initially developed during the Demonstration and Validation Phase and routinely updated.

f. Justification of Major System New Starts (JMSNS)

The JMSNS is required when a new start meets the criteria for a DoD major system or Air Force Designated Acquisition Program. It is included as a line item in the AFPOM for SECDEF consideration and is the basis of the Milestone 0 review. The JMSNS is not to exceed three (3) pages. It identifies the mission area and conceptually describes the role of the new system. It identifies the Defense Intelligence Agency (DIA) validated threat and existing systems shortfalls, alternative concepts, funding implications, constraints for satisfying the need, and it also provides a summary of the acquisition strategy.

g. Program Decision Memorandum (PDM)

The PDM is issued by the SECDEF at Milestone 0. It provides official sanction for a major system new start and authorizes the Air Force, when funds are available, to initiate the Concept Exploration Phase. The PDM is used by the SECDEF to provide appropriate guidance for the acquisition.

h. Program Management Directive (PMD)

The PMD is used to provide program direction and guidance. It is issued by AF/RDQM during the Mission Analysis Phase. The PMD defines the program, designates and tasks the implementing and participating commands, and specifies the review and approval requirements. It provides program constraints and/or thresholds, limits of authority, and prerequisites for Milestone 0 review. The PMD is also used to document the validation of the Statement of Operational Need (SON), provide a charter for the program, and, if necessary, to terminate a program.

i. Program Management Plan (PMP)

The PMP is prepared by the Program Manager (PM) during the Demonstration and Validation Phase. It is an iterative document based on the acquisition strategy developed by the implementing command and the PM. It provides for an economical, effective and efficient approach to achieving the program's objectives. As the program progresses, it guides the program toward identifying alternative approaches and satisfying mission needs. The PMP defines the support required of all participating commands, and does not require HQ USAF approval, unless specified in the PMD. The PMP is directive on all participating commands.

j. Preliminary System Operational Concept (PSOC)

The PSOC is used as a "for comment" draft of the formal document that describes the intended purpose, employment, deployment and support of a major system. Development of the PSOC begins in the Concept Exploration Phase and is included in the

Program Review Package submitted for Milestone I review. The PSOC is usually a generalized presentation of the operational system, operational environment, program scope, and system employment, deployment, support and safety considerations. After Milestone I review, the PSOC is revised, updated and finalized as the System Operational Concept (SOC).

k. System Concept Paper (SCP)

The SCP is used to provide preliminary documentation for use by the AFSARC and DSARC at Milestone I review. It summarizes the results of the concept exploration phase, describes the Air Force acquisition strategy, and identifies concepts to be carried to the Demonstration and Validation Phase. It references supporting documentation, and is not to exceed twelve (12) pages excluding annexes for Program Structure, Thresholds and Resources.

l. Secretary of Defense Decision Memorandum (SDDM)

The SDDM is issued by SECDEF at Milestone 0 to document a decision on lead component for joint JMSNS. SDDMs are issued by SECDEF at Milestone I and II (and III if necessary) to document decisions; they are used to stipulate "Not to Exceed" thresholds, exceptions to the normal acquisition process, timing for the next milestone, and other appropriate directions.

m. System Operational Concept (SOC)

The SOC is the formal document that describes in detail the intended purpose, employment, deployment and support of a major system. The SOC is developed during the Demonstration and Validation Phase as a result of updating and expanding the detail of the PSOC. It is included in the Milestone II review. During the Full-Scale Development Phase the SOC is updated and integrated into the ILSP.

n. Statement of Operational Need (SON)

The SON is a formal numbered document used to identify an operational deficiency and to state the need for a new or improved Air Force capability. It provides the basic justification to initiate a DoD major system or AFDAP. The SON is used to identify requirements based on one or more of the following: deficiency in existing capability; obsolescence of existing capability; enhanced cost effectiveness; technological opportunity to enhance effectiveness or lower cost; and, an exploitation opportunity (e.g. ability to exploit weakness of the enemy). All SONs originate with Major Commands (MAJCOMs) or Separate Operating Agencies (SOAs). The SON is staffed, coordinated, validated, assessed and prioritized before it is included in Milestone 0 review.

o. Test and Evaluation Management Plan (TEMP)

The TEMP is used to outline the Test and Evaluation program for a DoD major system or AFDAP. It is an iterative management plan that relates test objectives to required system characteristics and critical issues. It integrates objectives, responsibilities, resources and schedules for all testing and evaluation to be accomplished. It is initially prepared during the Concept Exploration Phase and submitted in conjunction with the SCP for Milestone I review. The TEMP is updated as needed and is included in the Phase Review Package for each Milestone review.

CHAPTER II

MPT PARTICIPATION IN THE INTEGRATED LOGISTIC SUPPORT PLANNING PROCESS

A. Introduction

The purpose of this chapter is to describe the Integrated Logistic Support (ILS) planning process and to assess its impact on MPT planning during the acquisition process. This description is presented in four parts. The first part identifies the policy basis for ILS program planning in the Air Force. The second part describes the Integrated Logistics Support Plan. The third part identifies ILS program planning participants and describes their roles and responsiblities. The final section of the chapter presents the relationship between Integrated Logistic Support MPT analysis and planning functions and the WSAP.

B. Policy Basis

1. Department of Defense

The primary Department of Defense (DoD) policy basis for the ILS planning process is contained in two directives issued at DoD level:

- DoD Directive 5000.39, 17 January 1980, Acquisition and Management of Integrated Logistic Support for Systems and Equipment;
- Military Standard (MIL-STD) 1388-1A, 25 January 1983, Proposed, Logistic Support Analysis.

These documents provide a uniform basis for use by all military services in satisfying ILS requirements. (See Chapter I, page 3, for a discussion of DoDD 5000.39 and MIL-STD 1388-1A.)

2. Air Force

Air Force policy for the ILS program is contained primarily in two regulations:

- AFR 800-8, 7 February 1980, Integrated Logistics Support (ILS) Program;
- AFLC/AFSCR 800-24, 27 May 1977, Standard Integrated Support Management System.

AFR 800-8 describes Air Force policy for ILS management and establishes procedures for applying ILS throughout the life cycle of systems and equipment. The regulation assigns responsibilities for conduct of ILS planning and identifies key ILS elements. It also specifies support considerations in the system acquisition process, including MPT requirements. Additionally, instructions for preparation of the Integrated Logistic Support Plan (ILSP) are presented.

AFLC/AFSCR 800-24 is a multi-service regulation issued jointly with the Army, Navy and Marine Corps. It provides a single source of information for the control and

management of ILS programs. It provides for a uniform ILS process throughout DoD through the application of common concepts, procedures and policies. The regulation integrates and standardizes acquisition and logistics support disciplines into properly time-phased actions to ensure weapon system and equipment readiness. Among the ILS elements specifically addressed are personnel, training and training support requirements.

C. The Integrated Logistics Support Plan

AFR 800-8 stipulates that Integrated Logistics Support is, "A unified and iterative approach to the management and technical activities necessary to:

(1) Cause support considerations to influence both requirement and design.

(2) Define support requirements that are optimally related to the design and to each other.

(3) Acquire the required support.

(4) Provide for the required support in the operational phase at minimum cost."

In short, ILS is concerned with the planning, procurement and management of all equipment, personnel and services necessary to support the development, deployment and operation of systems and equipment.

ILS is budgeted and funded as an integral part of the acquisition process and its requirements are integrated into all program management and contractual documents. ILS considerations for new acquisitions are addressed initially in Section 9 of the Program Management Plan (PMP). The PMP is developed and issued by the Program Manager and shows the integrated time-phased tasks and the resources necessary to support the acquisition process. The logistics portion of the PMP forms the basis for development of the Integrated Logistics Support Plan (ILSP) and, for certain other than major procurements, may replace the ILSP.

The ILSP is developed and used by the Program Manager and the Deputy Program Manager for Logistics (DPML) or the Integrated Logistics Support Manager (ILSM). The DPML is an experienced logistician who is assigned to a major system program office (SPO) to manage ILS; the ILSM is assigned to manage ILS for programs not designated as major.

The ILSP specifies the integration of the various ILS elements (Reliability and Maintainability, Supply Support, Manpower and Personnel, Training and Training Support, etc.) into a coherent plan and specifies methods of integrating them into the various aspects of program planning, engineering, designing, testing, evaluation, production, and operation. The ILSP also includes the integration of support elements with the mission elements of a system throughout its life-cyle.

The ILSP consists of three parts: General, Concepts/Strategy, and Milestone Schedule Charts. Part I, General, provides background information on the system, including its description, purpose and general performance characteristics. Also included is an identification of all participating organizations such as the Program Manager, the implementing command, the supporting command, the using command, the Contract

Administration Officer, and any other applicable focal points. The final section of Part I identifies those documents that provide guidance or criteria necessary to accomplish functions described in the ILSP.

Part II of the ILSP, Concepts/Strategy, is divided into six basic sections:

- Operations Concept,
- Maintenance Concept,
- Logistics Support Analysis,
- Acquisition Strategy,
- Test and Evaluation Concept,
- Other Concepts.

The operational concept is briefly described in terms of mission scenarios, operational environment, employment concepts and deployment plans. Sufficient detail as to such items as annual operating days, annual number of missions, mean mission duration, etc., must be presented to provide input to the Logistics Support Analysis (LSA) process.

The maintenance concept is briefly described in terms of requirements, considerations, and constraints. This description includes such elements as number and skill level of maintenance personnel, inventory levels, maintenance environment, levels of maintenance, operational reliability and survivabilty, etc. Sufficient detail such as turnaround time, mean time between maintenance, mean time to repair, etc., is provided to support LSA data requirements. Also included is pertinent information about interservicing, interim contractor support and contractor logistics support.

The LSA program is briefly described in terms of tasks required, the structure of the LSA data system and the contractor-Air Force interrelationships in the conduct of LSA.

The acquisition strategy briefly describes the procurement approach and defines new or innovative contractual approaches for life-cycle costs, logistics support costs, support cost guarantees, design-to-cost and other acquisition-related factors. Budget and funding policies which are in addition to, or which deviate from, standard procedures are also described.

The test and evaluation concept is briefly described in terms of design test and evaluation (DT&E) and operational test and evaluation (OT&E), participating organizations, and management relationships. Information on particular test requirements directly related to the ILS program and on the interface between LSA data system and the test program is included.

Other concepts include unique or innovative support concepts established or required to provide effective logistics support. Standard support concepts are not repeated except to show interface or rationale for the new concept.

Part III of the ILSP, Milestone Schedule Charts, addresses specific ILS functions to show the anticipated beginning and completion dates for each event, the assigned office of primary responsibility (OPR), and the applicable resource requirements. Among the

functional areas for which milestone schedule charts are prepared are Manpower Requirements and Personnel (MRP), and Training and Training Support (TTS).

The ILSP is an iterative document which is first prepared during the Concept Development Phase of the WSAP and updated and r vised periodically during the acquisition process. The adequacy of the ILSP is assessed during each AFSARC, DSARC or other program review. Once approved, the ILSP becomes directive on all participating commands.

The Logistics Support Analysis (LSA) is an integral part of the ILS program. It is an analytical logistics effort within the system's engineering process to identify, define, analyze, quantify, and process logistics support requirements. The primary functions of LSA are:

- Identify the quantitative and qualitative logistics considerations;
- Influence system and equipment design for logistics considerations;
- Communicate requirements and provide an integrating influence;
- Assess the achievement of logistics objectives.

The LSA is an iterative process developed from a series of analytical studies initiated prior to the Request For Proposal (RFP) and continually applied throughout the life-cycle of the system. Among the areas subjected to the ongoing LSA process are personnel requirements, skill levels, and Training and Training Support (TTS) requirements.

A detailed description of the LSA process may be found in AFLC/AFSCR 800-24 and MIL-STD-1388-1A.

D. Principal Participants

Assignment of participant responsibility in the ILS planning process is function-specific rather than organization-specific. That is, responsibilities are assigned to a specific activity based on its functional requirements within the acquisition process. The only activity specifically designated within the ILS planning process is that Deputy Chief of Staff for Logistics and Engineering (AF/LE) sets Air Force policy on ILS, issues specific ILS guidance in Program Management Directives (PMDs), and monitors the Air Force ILS program.

The functional organizations within the ILS process are:

- Implementing Command,
- Support Command,
- Air Training Command,
- Air Force Test and Evaluation Center,
- Operating Command.

Additionally, ILS responsibilities are assigned to two individuals. They are the Program Manager (PM) and the Deputy Program Manager for Logistics (DPML) or Integrated Logistics Support Manager (ILSM)

Though the functional requirements do not always equate exactly to specific organizations, some generalizations may be made. The implementing command is usually AFSC. The supporting command is usually AFLC. The training command is usually ATC. The test and evaluation center is usually AFTEC.

1. Implementing Command

The implementing command or agency is responsible for establishing and overseeing a management structure. The implementing command designates an office of primary responsibility for implementing ILS policies and procedures issued by HQ USAF. The command designates a Program Manager, identifies key ILS personnel, budgets and funds for ILS management, allocates necessary resources, determines training requirements and implements an ILS training program. Additionally, the implementing command is responsible for coordinating with the participating and test and evaluation commands on any appropriate issues related to the ILS process.

2. Supporting Command

The supporting command is responsible for creating the staff and support structure necessary to support the ILS process. The supporting command designates a DPML or ILSM, as appropriate, and assigns qualified logisticians to staff ILS offices. The command also provides logistics support requirements to the implementing command for inclusion in acquisition-related documentation.

3. Air Training Command

ATC is responsible for developing and conducting ILS training and education programs to meet implementing, supporting and using command needs. This command develops training and training support cost information necessary for tradeoff studies and other purposes and also defines contractor training requirements early enough to be negotiated while competition still exists.

4. Air Force Test and Evaluation Center

AFTEC is responsible for coordinating with the implementing, supporting, training, and using commands in preparing test and evaluation plans and objectives. AFTEC is also responsible for developing and maintaining procedures for the assessment of logistics support requirements during test and evaluation and providing feedback to participating commands for suitable action.

5. Operating Command

The operating command is responsible for preparing the SON which initiates the acquisition process. Following the approval of the SON, the operating command is responsible for participating with the implementing, supporting, and training commands in the development and implementation of an ILS program. The operating command is responsible for identifying well qualified personnel to assist the ILS office and also for allocating sufficient resources to implement ILS policies and procedures.

6. Program Manager

The Program Manager (PM) is responsible for overall implementation of the ILS program as part of the total acquisition process. The PM identifies and delegates program-related logistics support responsibilities and authority to the DPML/ILSM. The PM is responsible for preparing and issuing the ILSP and implementing it throughout the acquisition program. The PM conducts tradeoffs between design characteristics, operational support, and manpower requirements over the total program life-cycle. The PM insures that ILS requirements are defined and that the Integrated Support Plan (ISP) and related documents are used to monitor and evaluate the contractor's ILS performance.

7. DPML or ILSM

The DPML or ILSM is responsible for managing the ILS portion of the acquisition program and implementing the ILSP. He establishes and maintains programs to integrate logistics support considerations into systems engineering and development through the LSA. He integrates the ILS efforts of the participating commands and the contractor through correlation of the ILSP and ISP. He is responsible for insuring the initial and subsequent system designs are consistent with approved logistics concepts and requirements. The DPML or ILSM is the resident expert for logistics matters on the Program Manager's staff.

E. Relationship with WSAP MPT Planning

The ILS planning process is an integral part of the acquisition program and serves as the central focus for MPT planning activities within the WSAP. Exhibit II-1 presents an overview of the relationship between ILS MPT planning activities and the phases of the Weapon Systems Acquisition Process.

ILS related documents or ILS produced data are the basis for all MPT decisions in the acquisition process. Exhibit II-1 illustrates that each phase of the WSAP has important MPT logistics considerations. Issues of integrated logistic support are second only to operational performance standards in acquisition decision making.

The ILS process must coincide with and be part of the design process. The Program Manager is tasked with using logistics support analysis (LSA) to integrate supportability into the design and to document logistics requirements throughout the engineering design process. In particular, the Program Manager must use manpower analysis to influence weapon system design, and to determine the quantity, skill level and source of required manpower.

Exhibit II-1

MPT LOGISTICS CONSIDERATIONS IN THE WEAPON SYSTEM ACQUISITION PROCESS

- IDENTIFICATION OF MANPOWER CONSTRAINTS FOR INCLUSION IN THE JMSNS
- ANALYSIS OF MANPOWER DRIVERS IN CURRENT SYSTEMS
- EVALUATION OF MANPOWER IMPLICATIONS OF ALTERNATIVE OPERATIONAL AND SUPPORT CONCEPTS
- IDENTIFICATION OF MANPOWER REQUIREMENTS CONSISTENT WITH PROGRAM CONSTRAINTS
- IDENTIFICATION OF MANPOWER DRIVERS OF CURRENT SYSTEMS AND TARGETS FOR IMPROVEMENT IN THE NEW SYSTEM
- IDENTIFICATION OF CRITICAL MANPOWER PARAMETERS TO SYSTEM READINESS AND SUPPORT; ESTIMATION OF ACHIEVABLE VALUES COMPARED TO CURRENT SYSTEMS
- INCLUSION OF MANPOWER CONSIDERATIONS IN RFP, SOURCE SELECTION AND CONTRACTS
- CONDUCT OF TRADEOFFS AMONG SYSTEM CHARACTERISTICS, MANPOWER, AND SUPPORT CONCEPTS TO MEET PEACETIME READINESS AND WARTIME EMPLOYMENT OBJECTIVES
- ESTABLISHMENT OF A SET OF MANPOWER GOALS AND THRESHOLDS CONSISTENT WITH CONTEMPORARY BASELINE SYSTEM
- EVALUATION OF MANPOWER REQUIREMENTS FOR CHANGES IN KEY PARAMETERS AND EVALUATION OF ASSOCIATED IMPACTS ON SYSTEM READINESS
- ESTIMATION OF MANPOWER REQUIREMENTS BY WORK CENTER CONSISTENT WITH ESTABLISHED GOALS AND THRESHOLDS
- IDENTIFICATION OF UNIQUE SKILLS OR SPECIALTIES WHICH ARE IN SHORT SUPPLY
- ANALYSIS OF TRADEOFFS AMONG DESIGN, MANNING LEVELS AND OTHER LOGISTICS REQUIREMENTS TO MEET PROGRAM GOALS
- EVALUATION AND TESTING OF ADEQUACY OF PLANNED MANPOWER SUPPORT CONCEPTS AND RESOURCES TO MEET SYSTEM READINESS AND UTILIZATION OBJECTIVES
- AFFIRMATION OF THE ADEQUACY OF PLANNED MANPOWER TO MEET PEACETIME READINESS AND WARTIME EMPLOYMENT
- DOCUMENTATION OF PRELIMINARY MANNING AND SUPPORT ANALYSIS
- CONFIRMATION THAT MANPOWER REQUIREMENTS CAN BE MET FROM PROJECTED ASSETS
- CONTINUING EVALUATION AND ANALYSIS OF PLANNED MANPOWER REQUIREMENTS TO MEET SYSTEM READINESS GOALS

CHAPTER III

MANPOWER PLANNING IN THE ACQUISITION PROCESS

A. Introduction

The purpose of this chapter is to provide an overview of current manpower planning in the acquisition process. This chapter begins with a background discussion of the tools and techniques available within the Air Force for assessing MPT requirements associated with new acquisitions. This is followed by an overview of the manpower determination process included in the WSAP, a discussion of the Independent Cost Analysis Program (ICAP), and a brief explanation of the impact of manpower authorizations on manpower planning. The next section, Section F discusses seven potential areas for enhancements for manpower planning. The final section summarizes this chapter and suggests an existing opportunity, the Advanced Tactical Fighter (ATF) program, where MPT involvement early in the acquisition process would be welcome.

B. Background

In many ways the Air Force has been in the forefront in developing tools and techniques for assessing the MPT requirements associated with new acquisitions. Beginning in the mid-1960's, the Air Force Human Resources Laboratory (AFHRL) became the focus for efforts to integrate human resources research and systems acquisition.

The Air Force became sensitive to the importance of the man-machine interface earlier than the other services because of its technological orientation. Research has centered on the human engineering problems of fitting the machine to the human body and to human capabilities and limitations. It has also centered on management-oriented techniques such as assessing the quantities and skills of the manpower required to support the operation and maintenance of the system as well as the type and content of the training necessary to create those skills. Among the major tools developed by the Air Force for determining and managing MPT assets are the Logistics Composite Model (LCOM), the Management Engineering Program (MEP), and ASSET (Acquisition of Supportable Systems Evaluation Technology).

LCOM is probably the most sophisticated tool available to any of the armed services for determining system-related maintenance manpower requirements. It is a large-scale computer simulation model which computes direct labor requirements for aircraft maintenance. Appendix E contains a detailed discussion of the application of LCOM.

The Air Force Management Engineering Program (MEP) is a set of analytical tools for improving productivity and determining standardized manpower requirements for improving utilization. MEP is generally applied to existing work centers where sufficient data exist for analysis of manpower utilization. A discussion of MEP is contained in Appendix F.

ASSET is a set of tools, just completed under the sponsorship of AFHRL, for integrating weapon system design, logistics support and operational concepts to achieve the optimum balance between readiness, capability and support. ASSET represents the culmination of a long-term effort to consolidate acquisition-related human resource technologies into a single, readily accessible package. Though it is not yet in common use, ASSET promises to be a major tool for program managers in the MPT determination process. A description of ASSET is contained in Appendix G.

The manpower determination process must be viewed as two separate phases. The first phase is the determination of the particular manpower requirements necessary to field, operate and support an individual system. These estimates are used to program manpower resources and to plan training programs. The second phase is the determination and management of the aggregate level manpower requirements associated with the total acquisition program. These aggregations are necessary for determining the impact of the acquisition program on Air Force end strength, grade structure, AFSC management and for planning personnel accession and retention policies.

Historically, the Air Force has been much more proficient in determining the unit level requirements than in managing the aggregate requirements.* Though Air Force level aggregation of system-driven manpower requirements may seem to invite greater DoD scrutiny, without such aggregation there can be no effective management of this critical resource.

C. Manpower Determination Overview

The Air Force acquisition process begins with submission of the SON. At this point, manpower participation is limited to an assessment of any manpower constraints expected to be encountered (AFR 57-1). Following program initiation, the PMD is issued by the Air Staff and directs the user to estimate manpower requirements and indicate major functional efforts (HOI 800-2). The PMD does not direct or provide for new manpower authorizations. Any manpower adjustments required as a result of the PMD must be accommodated within existing manpower allocations.

The first task of the newly established SPO will generally be the preparation and distribution of a Request for Proposal (RFP) which solicits design and development proposals from private sector contractors. (At times the RFP may be developed and distributed prior to formal establishment of the SPO.)

The RFP generally incorporates requirements for MPT gross level analysis as part of the whole range of supportability requirements. As a part of the RFP development, the MPT criteria for use in source selection are developed, though MPT is often of very low priority in source selection. Logistics criteria are generally ranked after operational performance and acquisition cost criteria, with MPT criteria of lowest priority within logistics.**

Support for the SPO in development of MPT requirements for the RFP is provided by the Acquisition Logistics Division (AF ALD), an AFLC activity colocated with the Aeronautical Systems Division (ASD) at Wright-Patterson AFB. ALD also assists in preparation of MPT constraints and statements of work based on user provided data. ALD reviews such program documentation as the JMSNS and DCP to ensure that MPT requirements have been included. ALD only assures that requirements have been identified and does not attempt to assess the quality of those requirements. ALD is not a part of the SPO though it does provide the DPML and may, in larger SPOs, provide other logistics personnel. It primarily acts in a capacity of a consultant to the DPML in the mechanism of including MPT requirements in program documentation.

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*Discussions with personnel within AF/MP and AFHRL indicate that a capability exists for projecting individual system requirements for the outyears (post FYDP) but there is limited capability for planning and managing aggregate requirements during that period.

**Based on information provided by AF ALD/PTA personnel.

The earliest system-related manpower estimates will be found in the contractor's response to the RFP. In general, these estimates will tend to understate the requirements as they will actually exist in the Air Force.* Contractor estimates include only direct maintenance manhours and do not include nonproductive requirements resulting from policy decisions such as twenty-four hour shop manning or an organizational policy requiring two crew chiefs for each aircraft. Contractor estimates generally will not include workload associated with "cannot duplicate" maintenance activities; that is components which indicate a fault while on the aircraft but which function satisfactorily in the shop. Finally, the maintenance workload is often based on the competence level of contractor maintenance personnel which is generally higher than that of corresponding Air Force personnel.

Once source selection has been completed, contractor estimates provide the departure point for the manpower requirements determination process and preliminary application of Instructional Systems Development. SPO engineering personnel, with assistance from the user, will assess the adequacy of the initial estimates, generally through comparability analysis, and will make necessary adjustments to the initial manpower estimates.

Comparability analysis is the process of using an existing system to predict the manpower requirements of a new system. The most important step in this analysis is the selection of the system upon which to base comparability. The system should be similar in design, function, operational characteristics and requirements, and maintenance concept. Differences (deltas) between the existing and the proposed system are determined based on projected reliability and maintenance factors, performance characteristics, operational requirements and maintenance concepts. These deltas are then applied to the validated requirements of the existing system to determine estimated requirements for the new system. Though simple in concept, the actual determination of system deltas is a complex activity requiring the services of a skilled analyst experienced in assessing the manpower impact of design concepts and engineering proposals. Such analysts are not currently available within the SPO and effective utilization of resources would mitigate against such assignment. Such comparability analysis services could be provided most effectively from a central resource within the product divisions.

These manpower estimates are in the form of direct maintenance workload and maintenance networks. These estimates are converted to estimated manning requirements in terms of AFSC and grade through a combination of LCOM simulation and the application of MEP-derived standards.

As a general statement, LCOM is used to simulate work centers involved in direct labor maintenance; standards are utilized for work centers not involved in hands-on maintenance or for which sufficient data do not exist for simulation. A combination of LCOM and standards may be utilized for those work centers involving both direct maintenance and overhead activities. Estimated manning requirements may also be modified to reflect user input for organizational requirements.

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*This problem was addressed in Comptroller General's Report PSAD-81-17, 19 January 1981. Additionally, contractor understatement of requirements seems to be accepted knowledge among those experienced in acquisition manpower. Though no empirical studies of general Air Force procurements have been identified during this project, the LMI report, "Manning of Recently Fielded Systems: Case Study of the Air Force E-3A (AWACS)," discusses the problem of contractor understatement for a specific system.

The process for determining requirements for aircraft modifications and new subsystems designed for installation on existing aircraft is slightly different than that for new aircraft. The maintenance manhour requirements are determined by the subsystem or mod SPO in coordination with the appropriate aircraft SPO and the user. Together, they develop the maintenance concept and identify AFSC availability for support of the new subsystem or mod. Utilizing this data, the subsystem SPO develops the maintenance manhour estimates required to support its program. The manhour estimates are then provided to the aircraft SPO for LCOM simulation and standards application. If the subsystem is a replacement for an existing capability, the new estimates are used in place of those for the existing subsystem. If the subsystem creates a new capability and does not replace any existing subsystem, the new estimates are added to the existing data base. LCOM simulations and standards are then applied to assess the impact of the new subsystem or mod on the aircraft manning requirements.

One category of manpower requirements not addressed in this method is logistics support manpower. Logistics support manpower not involved in direct operation and maintenance is determined by AFLC and is programmed in the AFLC Program Decision Package (PDP) (AFRs 23-2, 800-2, and 800-8). These estimates include the logistics manpower required to acquire and to support the system.

The logistics support manpower is primarily determined through one of three methods. For systems early in the acquisition process which lack a base of logistics support data, requirements are determined manually using standard manpower methods and submitted via Air Force Form 602, Request for a Change in Manpower Authorizations. AF Form 602 is based on requirements determined by an AFLC management engineering team. When a system has been in the inventory long enough to develop a base of logistics support data (about two years), the Logistics Manpower Model (LMM) is used to refine the estimates of logistics support manpower requirements and to assess the impact of subsystems or modifications on those requirements. Decision tree analysis is utilized to determine if depot level maintenance can be most effectively provided by organic Air Force assets or by contractor support.

The AFLC determination of support manpower parallels the SPO development of O&M requirements. The support requirements and the O&M requirements are contained in separate PDPs and are funded independently.

Manpower requirements estimates are continually revised during the acquisition process in response to system development. During the Demonstration and Validation Phase manpower requirements are subjected to support tradeoff decisions and the sensitivity of manpower requirements to changes in key parameters (R&M, utilization rate, etc.) is assessed. During the Full-Scale Development Phase manning levels are subjected to detailed analysis and tradeoffs with design and logistics support characteristics; test and evaluation is conducted to assess the adequacy of planned manpower; a preliminary manning document is prepared and an evaluation is made to ensure manpower requirements can be met from projected Air Force assets.

When the program has progressed to Full Scale Engineering Development, it is subjected to test and evaluation (T&E). T&E is managed and implemented by the Air Force Test and Evaluation Center (AFTEC).

The role of AFTEC in the manpower process is one of an evaluator rather than a determiner. AFTEC assesses the adequacy of the manpower planning and the proposed system manning for the support of system operational requirements. Though AFTEC is responsible for the T&E program, the implementing command retains responsibility for

validation of the Task Order (AFR 80-14). While AFTEC is not directly involved in requirements determination, some "fine tuning" of requirements invariably occurs as a result of test and evaluation. Occasionally, in cases such as the E-3A, major revision of manpower requirements may occur during OT&E. (See Appendix H for a discussion of E-3A manpower planning.)

Manpower planning is at best a moving target. There is no single, absolute relationship between hardware and manpower. There are many variables which enter into consideration. The operational scenario and maintenance concept are prime drivers of manpower. Increased system utilization means increased maintenance requirements for a fixed hardware design. The quantitative requirements are sensitive to the qualitative attributes of assigned personnel. Policy requirements such as continuous manning and key personnel redundancy create manpower requirements not directly related to design. There is no single, set method of manpower determination; at various times and under various conditions, LCOM, comparability analysis and standards developed by the management engineering program may all be appropriate.* The available techniques must be tailored to each acquisition program in response to the design, state of the art involved, and the operations and maintenance concepts. The only way to ensure effective manpower planning is to develop a program of early and continuous activity which includes interaction between the SPO, the developing contractor, the user, and the Air Staff managers of MPT resources. Case studies of the manpower planning associated with three major aircraft procurements are contained in Appendix H.

Manpower requirements developed during the acquisition are subjected to numerous reviews by the SPO, the user, AFSC, AFTEC, the Air Staff and the AFSARC and DSARC if applicable. At the Air Staff level, one review with potential for assessing the impact of MPT requirement on system ownership costs is the Independent Cost Analysis.

D. The Independent Cost Analysis Program

The goal of the Independent Cost Analysis Program (ICAP) is an assessment of the reasonableness of official SPO cost estimates through independently prepared cost estimates. ICAP policy, established by AFR 173-11, directs that ICAP cost estimates are to be prepared using cost estimating methods different from those employed by the SPO, where possible, and are to be prepared by a study team totally separate from the SPO. As an effort to ensure comparable estimates, unit costs used for ICAP estimates are required to be relatable to other official program estimates found in the DCP, FYDP and SARs and to be relatable to cost estimates from prior DSARCs. In general, ICAP estimates are prepared on a contractual basis by organizations familiar with the development and management of acquisition programs.

The ICAP is comprised of three types of studies: an Independent Cost Analysis (ICA), an Independent Sufficiency Review (ISR), and an Independent Cost Study (ICS). ICAs and ISRs are required to be prepared on all major weapon system programs subject to DSARC and AFSARC review, while ICSs are special independent cost studies under-

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*Additionally, the Air Force has experienced difficulty in moving newly developed manpower models and techniques from the laboratories to the field. A good example of this is the newly developed ASSET program which provides an early MPT analysis capability, but for which there is no established implementation. AFHRL reports and studies have been recommending early MPT analysis during the acquisition process since the mid-1960s and have achieved only mixed results.

taken only upon request. ICA is an in-depth ICAP study used to aid decision making in DSARC/AFSARC Program Milestone Reviews I, II and III. ISRs, on the other hand, are summary evaluations of the validity of SPO cost estimates presented to the Comptroller of the Air Force (AF/AC) and the Assistant Secretary of the Air Force for Financial Management (SAF/FM) when SPO budget requirements presentations are made.

All ICAP studies are reviewed by AF/AC and an Air Force Cost Analysis Improvement Group (CAIG). ICA studies are also reviewed by SAF/FM, an OSD CAIG, DSARC and AFSARC. AF CAIG membership for any one ICAP study is to consist of representatives from at least the nine specified Air Force HQ and SAF offices shown below:

- Assistant Secretary of the Air Force, Research, Development and Logistics (SAF/ALP);
- Assistant Secretary of the Air Force, Financial Management (SAF/FMF);
- Comptroller of the Air Force (AF/AC);
- Deputy Chief of Staff, Manpower and Personnel (AF/MP);
- Deputy Chief of Staff, Plans and Operations (AF/XO);
- Deputy Chief of Staff, Research, Development and Acquisition (AF/RD);
- Deputy Chief of Staff, Logistics and Engineering (AF/LE);
- Deputy Chief of Staff, Programs and Resources (AF/PR);
- Assistant Deputy Chief of Staff, Studies and Analyses (AF/SA).

The Directorate of Cost and Management Analysis (AF/ACM) is delegated the responsibility for managing the ICAP. AFSC or AFLC is often designated as the MAJCOM to lead an ICAP study and to assign an OPR. The Program Manager assigns a liaison to provide an ICAP study team with SPO cost estimate documentation.

Certain cost estimating methodologies are prescribed for use in ICA studies per AFR 173-11. These methodologies are mandated to be as far different from the SPO cost estimating method as possible. The use of parametric cost estimating techniques and analog methods are encouraged for DSARC I and II reviews. Sensitivity analysis using frequency distributions or ranges of costs is required for cost estimates with a large probability of uncertainty. A detailed "risk" assessment based on cost estimating relationships or Monte Carlo simulations must be performed to estimate the risk involved with the cost estimating techniques used and with technical or schedule uncertainties that may have an effect on cost estimates. Whenever possible, but especially for DSARC III reviews, actual cost data on prototype units and early engineering development hardware are to be employed.

There are several specific problems associated with the current application of ICA to an analysis of MPT costs. First, no specific manpower cost element is included in the AF 173-11 list of required life cycle costs in ICA cost estimation, except for the encompassing Operating and Support (O&S) category. O&S or ownership costs refers to the

myriad of costs "associated with operating, modifying, maintaining, supplying, and supporting a weapon/support system" (AFR 800-5). Included in O&S costs are costs for such manpower unrelated elements as spare parts and military construction. The only specifically designated MPT cost in AFR 173-11 is training.

A second problem limiting the value of the ICA is that it is an estimate of the reasonableness of the costs associated with the identified requirements. No estimate is made as to the reasonableness of the requirements themselves. To have real value as an MPT life cycle costing forum, the validity of the manpower requirements must be assessed as well. This would allow for a true evaluation of the manpower life cycle costs associated with the system.

A third problem concerns comparing ICAP estimates with the official SPO estimates. For example, in the development of the F-16, ICA manpower estimates were based on Air Staff approved requirements in the form of prior LCOM studies conducted a full one to two years earlier. SPO estimates, on the other hand, relied on very recent data not yet reviewed by the Air Force Management Engineering Agency (AFMEA) and the Air Staff. Apparently, the ICA study team either ignored or was unaware of the recent actual data. Furthermore, the ICA F-16 estimates included costs for equipment and tasks (adjusted by the Air Staff with TAC's aid) that were excluded from SPO estimates.*

Finally, ICA estimates at Milestone I have a history of not being detailed enough to resolve MPT planning questions. As a result, manpower portions of system costs are often waived from consideration.

E. Manpower Authorizations

In general, manpower requirements are developed without constraint from either funding or personnel inventory. Authorizations are developed as a result of applying funding constraints to the unconstrained manpower requirements. Authorizations designate the allocation of manpower to commands, bases and units based on grade, skill level and occupational specialty. Requirements are generally developed at the unit level and submitted to the Air Staff for approval, while authorizations are determined at the Air Staff level and distributed to subordinate Air Force activities.

Though authorizations form the basis for planning personnel assignments, the authorization development process normally does not consider personnel inventory as a constraint consideration. As a result, approved authorizations have contributed to the development of nonsupportable grade structures in some occupational fields.** At the direction of AF/MP, AFMEA is currently conducting an effort to restructure the authorizations for unbalanced occupational fields. The purpose of the effort is to correlate authorizations with anticipated personnel inventories in order to improve the self supportability of the enlisted grade structure. Long range projections of manpower requirements and personnel inventories would facilitate early planning for career field balancing thus reducing retraining requirements and stabilizing career development.

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*Manpower Planning for the F-16, Thomas A. White, Logistics Management Institute, April, 1979.

**A nonsupportable grade structure is one which does not allow for normal career

F. Potential Enhancements for Manpower Planning

The Air Force generally has effective tools for determining manpower requirements. The major problems currently experienced relate to the application of those tools and the organizational structure for their management. There are several potential areas for enhancing the effective determination of system-driven manpower requirements; among these are:

- Establishment of a focal point for management of system-driven manpower and personnel requirements;
- Formalization of procedures for reporting manpower information;
- Establishment of an MPT section at the development level;
- Inclusion of all manpower requirement PDPs for a system in a single POM submission;
- Identification of total manpower requirements during the acquisition process;
- Establishment of incentives for performing early, effective manpower planning;
- Aggregation and assessment of the total Air Force-wide acquisition-related manpower requirements for the outyears (post FYDP).

1. Establishment of a Focal Point

There currently is no single Air Force organization specifically tasked with dealing with acquisition-related MPT issues.* During the course of this study, interviews were conducted with personnel at six SPOs, HQ AFLC, ASD, SAC and other Air Staff organizations to determine their level of interaction with AF/MP on acquisition-related manpower issues. None of those interviewed reported any significant level of interaction. The general perception expressed was that AF/MP has little interest in acquisition-related MPT activities outside of the POM process. Whether this perception is true or not, none of those interviewed knew who in AF/MP to contact concerning acquisition-related manpower issues.

As a result, SPOs tend to defer to the using MAJCOM on manpower issues outside their area of expertise. While it is highly desirable for the SPOs to deal primarily with the intended user for establishment of the official MAJCOM position, and while utilization of MAJCOM resources within Air Force imposed authorizations is a MAJCOM prerogative, there are certain Air Force-wide issues, such as AFSC restructuring, which may be beyond the control of the user or which, from his command-oriented position, he lacks the perspective to deal with in the aggregate.

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progression from E-1 through E-9 for all personnel entering the occupational field.

*While HP 21-1 assigns AF/MPX responsibility for managing AF/MP planning for total force, various other Air Staff sections are assigned specific acquisition-related MPT responsibilities in a number of AFRs (See Appendix B).

Primary SPO interaction with the MAJCOM on manpower issues occurs with logistics maintenance personnel who develop task requirements and designate AFSC and skill level utilization. The MAJCOM manpower organization will develop a manpower profile against the AFSC shredout provided by the OPR. Requests for new AFSC shredouts are submitted to MPC for action (See Chapter IV).

There are currently initiatives under way which have the potential for creating an MPT focus within AFSC. The Deputy Chief of Staff for Acquisition Logistics (AFSC/AL) has been established at Andrews AFB; within AFSC/AL are a Policies and Programs Directorate (AFSC/ALX) and the Program Readiness and Support Directive (AFSC/ALP) which will deal with MPT issues among others. AFSC/ALX will have responsibility for developing policies and directives implementing AFSC/AL programs; AFSC/ALP will be responsible for interfacing with the SPO and monitoring project development status. Within AFSC/ALX is the Acquisition Policy Branch (AFSC/ALXL) which will deal specifically with acquisition policy issues (including MPT). Manpower, personnel and training will be addressed by AFSC/ALXL as traditional ILS elements. No specific requirements have been established for reporting MPT information though efforts are under way to strengthen ILS element identification in all existing acquisition reports and documents.

AFSC/AL was created because there was no organizational focus for logistics issues within AFSC; of the 15 logistics elements which the directorate will address, three are directly related to MPT. The current plan is to create the AL organization at AFSC headquarters with staffing of about 105-110 people and to repeat the organizational structure at the product divisions. At the product division level, the organizations will be joint AFSC-AFLC organizations. To date, four product divisions have created AL staffs: Electronic Systems, Armament, Space, and Ballistic Missiles. Aeronautical Systems Division has not, though it is currently in the planning stages.

AFSC/AL is still in the organizational stages and it is too early to determine its effectiveness in the coordination and management of MPT issues. However, the creation of the organization and its designation at DCS level are important steps in recognizing the importance of logistics support (including MPT) in the acquisition of new systems. AFSC/AL is the only staff organization identified within the AFSC as having the specific mission of monitoring and managing the logistics support elements for new systems. As AFSC is the implementing command for the majority of Air Force acquisitions, AFSC/AL may become the de facto Air Force focus for establishing Air Force acquisition policy and monitoring and managing the logistics program for all Air Force acquisitions.

2. Formalization of Reporting Procedures

There currently are no formal procedures detailing either timing or content for reporting of acquisition-related manpower information. Air Staff generally does not receive detailed MPT data for major systems until after DSARC II and often does not receive information on nonmajor systems until the first POM submission, far beyond the time for effective participation in tradeoff decisions.

Similarly, there are no formal reporting procedures between the SPO and the using MAJCOM. Manpower information is generally forwarded in response to request. SAC

personnel (SAC/LGB) attribute infrequent SPO reporting to lack of expertise within the SPO to develop reliable manpower estimates.*

Current manpower reporting procedures do not provide sufficient lead time for the personnel and training communities. Manpower requirements can be reprogrammed from year to year. Personnel procurement programs and training pipelines are not so easily created and modified. Training programs may take five to seven years to design, develop and implement; personnel procurement programs which may require changes to the existing compensation program or revisions to congressionally mandated quality standards may take years to accomplish.

Currently developed program documentation does not provide sufficient manpower requirements information upon which to base personnel and training planning decisions. Manpower requirements reported in such documents as the PSOC/SOC, DCP, and ILSP are at best inconsistent and often nonexistent. Appendix I contains the results of a survey of manpower, personnel and training information contained in selected program documentation developed as a part of eight Air Force acquisitions.

3. Establishment of an MPT Section at the Development Level

The Deputy Program Manager for Logistics (DPML) is generally assigned the responsibility for ensuring adequate MPT planning is accomplished; in practice, this responsibility is often delegated to the ILS Manager. There is generally no dedicated, trained MPT analyst assigned to the SPO.** This limits the DPML's flexibility and increases his dependency on contractor estimates and user support for determining manpower requirements.

The lack of a dedicated staff has its greatest effect on the SPO's ability to develop early assessments of manpower requirements. If manpower is to be considered in system design tradeoff decisions, reliable estimates must be available during the concept development phase. As is currently practiced, Air Force evaluation of manpower requirements often does not occur until late in the Design and Validation Phase, with LCOM simulation often not occurring until Full-Scale Engineering Development (FSED). This late participation often leaves the contractor estimates as the only manpower input in design tradeoff decisions. (See footnote on page III-3.)

A real potential for manpower tradeoffs exists during the early concept development and design phases. There is little benefit to reducing direct labor workload if operational and organizational requirements create idle time. The manpower costs associated with an "open door" (i.e., 24 hour operations) maintenance shop policy may be far greater than might otherwise be justified by direct labor requirements. Once an operational scenario and maintenance concept have been established, a good portion of the system-related manpower becomes, in effect, a sunk cost with only minor adjustments available in the latter stages. The capability for conducting early assessments exists within the Air Force; the only requirement is assembling a skilled staff to perform

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*SAC/LGXB reports that manpower estimates (numbers, AFSCs, and skill levels) for the B-1B were developed by SAC personnel and provided to the SPO; LCOM simulation for the B-1B was conducted using contractor supplied estimates.

**Major programs such as the MX or B-1B will frequently have an MPT analyst assigned to the SPO on a TDY basis from the using MAJCOM.

the analyses. This staff should be located within the product divisions to provide service to the SPOs. Personnel capable of performing this analysis are currently available within the Air Force in the various METs and LCOM shops. Only limited additional training in any unique function related to new acquisitions would be required.

During the mid-1970s the Air Force assembled such a skilled staff at ASD; their original direct labor estimates for the F-16 are still valid within five percent. For a variety of reasons, including a lack of command interest in early determinations, the manpower assessment capability built up during this period was allowed to dissipate as personnel were reassigned and not replaced. Though the F-16 is frequently cited as a good example of manpower planning, the capability which produced those estimates is no longer available within ASD. The ASD LCOM shop currently has less than one third the number of manpower analysts who were available during that period; as a result, LCOM simulation commonly does not occur until a program enters engineering development.*

Lack of a dedicated MPT staff also creates problems in related areas. There is no readily available, knowledgeable MPT point of contact for ATC, the Air Staff, AFTEC or any other agency interested in the system-related MPT requirements. Agencies interacting within the SPO oftem must deal with individuals for whom MPT is a collateral interest and one in which they are not well versed.** Likewise, there is no one specifically charged with monitoring and evaluating the efforts of outside agencies supporting the program's MPT planning efforts.

Establishing an MPT section within the SPO or making that capability available within the product divisions would give the Program Manager the capability needed to conduct early assessments and to ensure that MPT considerations are sufficiently developed for inclusion in tradeoff decisions. In short, it would provide the Program Manager with the staff resources needed to exploit the MPT tools and techniques available to him.

4. Inclusion of Manpower Requirement PDPs in a Single POM Submission

The total manpower necessary to accomplish development, deployment, operation, maintenance and support is not programmed through a single PDP submission. The operational and direct support manpower is programmed through the user's PDP; logistics support manpower is the result of an AFLC submission; R&D program manpower is included in the AFSC submission; and, training requirements are in the ATC submission. (See Chapter VI for a discussion of the programming of training resources.) As a result of this multitude of submissions, a new system may be funded without some or all of its MPT support requirements; a hardware program may in fact compete against its own support requirements for funding.

By way of example, in the recent POM submission, the B-1B and its O&M manpower were funded while the AFLC determined support manpower was not.*** The net result of unfunded support requirements is increased cost to the Air Force in terms of

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*Based on interviews with personnel from ASD/EN, AFTEC and AFHRL.

**Of the six SPOs contacted within ASD, no individuals could be identified who had more than a cursory knowledge of MPT requirements determination.

***Representatives from AFLC/MPM indicate that funding for logistics support, support equipment and logistics manpower is often deferred to increase the hardware buy.

deferred workload, increased turnaround time for depot level maintenance, increased personnel turnover due to excessive workload, or expensive contractor support for maintenance activities which cannot be completed by organic assets.

Replacement of an existing system does not immediately free existing manpower for support of the new system. AFSC and grade structure may not be ideal for the new system and extensive retraining may be required. Additionally, an initial maintenance surge usually accompanies replacement of an existing system. Not only must the new system be supported, but the old system must be prepared for scrapping or transfer to war storage. Time estimates of the surge period for a major system replacement such as the B-1B - B-52 transition run as high as two years. Existence of the maintenance surge will exacerbate an already serious maintenance problem created by unfunded logistics support manpower requirements.

All manpower requirements should be programmed in a single package along with hardware funding. O&M manpower, AFLC-determined logistics manpower and ATC-determined training resource requirements should be combined into a single PDP to ensure funding of the entire MPT package. The MPT package should then be tied to hardware funding, resulting in the total weapon system requirement (hardware, O&M and logistics manpower, training equipment, etc.) being contained in a single acquisition funding package. This coordination of POM submissions would help prevent funding of hardware without the necessary support. Requirements should be established to prevent nonfunding of support requirements when the hardware is funded. Put simply, if you buy the system, you buy the support.

5. Identification of Total Manpower Requirements for the Acquisition

Total manpower requirements are not generally identified during the acquisition process. While manpower requirements associated with operations, maintenance, and logistics support are the subject of close scrutiny, wing overhead manpower (cooks, clerks, medics, security police, etc.) are not usually the subject of individual assessments. Overhead manpower is allocated based on a formula developed from past experience with similar aircraft types. This approach is satisfactory as long as basing and bed down concepts and maintenance concepts are similar to past utilization. When radical new concepts such as remote basing and satellite air fields are implemented, a virtually hidden demand for overhead manpower is created. This demand may not always be recognized during the early tradeoff decisions and may result in funding of a system with a much higher manpower cost than anticipated. Manpower of this type is not system specific, but it is driven by operational requirements and should be individually considered when any new bed down or maintenance concept is proposed.*

6. Establishment of Incentives for Effective Planning

Neither the Program Manager nor the developing contractor has any real incentives for conducting early, reliable assessments of manpower requirements. In the source selection criteria, MPT issues generally have the lowest priority within the logistics criteria which in turn generally rank last in order following operational performance and procurement cost. In reality, contractors have a positive incentive for understating MPT costs in development proposals; realistic estimates of MPT requirements may raise the

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*Chapter VI contains a discussion of the effect of the operational scenario on non-maintenance manpower.

life cycle cost of the system and thus make the proposal less competitive. A contractor suffers no penalty, financial or otherwise, for failing to make accurate initial MPT estimates. The Program Manager likewise has no incentive for ensuring that early MPT estimates are accurate and that they are considered in tradeoff decisions.* The Program Manager's primary responsibility is to produce a system with the desired operational capabilities at the lowest possible procurement cost. Though life cycle costing is gaining wider acceptance in defense procurement, the short-term nature of the congressional budgeting cycle still places greater emphasis on the near-term procurement cost than on the longer-term support cost.

Definite incentives for improved contractor manpower analysis should be established. Improved visibility should be given to the entire range of logistics support issues during source selection. Most important, clauses should be included in development contracts which impose a financial burden for substantial understatement of manpower requirements. Limits should be established on the allowable (unpenalized) growth of direct labor manhour estimates; for example, the contractor would be allowed a direct labor growth of five percent before suffering a performance penalty. Manpower requirements growth associated with changes in Air Force policy, performance characteristics, or operational requirements should not be assessed against the contractor's allowable limits. Financial incentives are important if early contractor MPT estimates are to be valid; in the words of an ALD logistics manager, "No contractor is going to pay attention to MPT until it costs him money not to."

7. Aggregation and Assessment

The Air Force currently has no method for aggregating and assessing the total demand for acquisition-related manpower requirements during the out years (post FYDP). This shortcoming is especially significant in that there is no capability for assessing the impact of these requirements on Air Force management of skills, grade structure or end strength. Because of the inability to identify long-range macro level requirements, there is no capability for assessing Air Force requirements against projected inventory in order to develop the necessary personnel plans to ensure that the future force will be capable of supporting system requirements.

The Air Force currently has effective tools for projecting the manpower requirements associated with individual systems. There is not, however, a corresponding set of tools for aggregating and assessing the manpower impact of the entire acquisition program during the out years. While it is possible to assess the MPT ownership costs of individual systems, these assessments are made in isolation and it is currently not possible to assess the MPT ownership costs of the entire acquisition program. A capability is needed to identify and aggregate the long-range manpower requirements associated with both new and existing systems. Quantitative and qualitative manpower requirements should be associated with the acquisition program and should be identified in relationship to the year in which they are required. This capability should be for fairly long projections, a minimum of 15 years, to correspond to the five years of the FYDP and the ten years of the EPA. Further, methodologies should be developed for comparing the total acquisition-related MPT requirement to resource projections in order to evaluate Air Force-wide MPT supportability of the acquisition program.

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*The effects of poor manpower planning may take years to appear, long after the Program Manager has been evaluated on his job performance and moved on to other areas.

G. Conclusions

The Air Force currently possesses effective tools for the early determination of manpower requirements for individual acquisition programs, perhaps the best currently available in DoD, though some difficulties exist in transferring the appropriate technology from the laboratory to the user. Existing organizations, both at the Air Staff and SPO levels, are not structured for optimum utilization of these tools; this lack of a specific organizational framework limits the effectiveness of MPT participation in the early phases of the acquisition process and reduces the impact of MPT issues on design and development decisions. Minimal organizational restructuring would greatly enhance the effectiveness of individual system manpower determinations without a requirement for development of additional methodologies or models.

The Advanced Tactical Fighter (ATF) is currently in the very early stages of conceptual development and represents a unique opportunity to evaluate the effectiveness of MPT participation in the acquisition process. Initial contact has been made with the ATF conceptual development team (pre-SPO) and they would welcome early and continuous MPT involvement. Because the ATF concept will require a substantial number of increases in the state-of-the-art in aircraft design, they anticipate that MPT supportability will be a critical factor.

The operational scenario is being drafted but is not yet at the stage of including detailed support data, though TAC has completed a preliminary basic maintenance concept. The RFP has not yet been released and source selection criteria are being established, though the concept development team anticipates they may not down select for initial conceptual development. The initial RFP to be let will be for the air frame; an engine RFP will be let separately. Primary ATF contact with the Air Staff has been with the Weapon Systems Programs Division (AF/LEXW) within the Directorate of Logistics Plans and Programs.

The ATF program represents a unique opportunity for MPT participation when almost all design and support decisions remain to be made. In particular, the ATF staff has expressed a desire to have MPT coordination on the conceptual development RFP. They require assistance on estimates of skills, AFSC structure, and basing and support requirements.

It is recommended that a point-of-contact be designated within AF/MP to coordinate MPT participation in the ATF acquisition. This program can be utilized as a test of the effectiveness of early MPT participation and an assessment of the relative weight given to MPT issues by acquisition decision makers. Early active participation will provide data to allow early LCOM simulation and provide a test bed for evaluating the effectiveness of ASSET. The experience gained through participation in the ATF program can form a basis for developing requirements and methodologies for future MPT involvement in the WSAP.

Specific recommendations for enhancing manpower participations in the acquisition process are contained in Chapter VII.

CHAPTER IV

TRAINING PLANNING IN THE ACQUISITION PROCESS

A. Introduction

Training planning is a continuous process which occurs throughout the development and operational life of the weapon system. Training development follows the same course as the development of the weapon system it will support. The training plan begins as a general conceptualization of training resources required to support the conceptual weapon system and evolves into a detailed plan of courses, student load, devices and materials necessary to support a now existing weapon system.

The primary regulations governing training planning in the acquisition process are AFR 50-8 and AFR 50-11. AFR 50-8, Instructional Systems Development (ISD), establishes ISD policies and responsibilities and establishes the requirement for preparation and submission of the Training Program Development Management Plan (TPDMP) and presents its format and content requirements. AFR 50-11, Management and Utilization of Training Devices, establishes policy for identifying and processing training device requirements and for programming and managing training devices.

The purpose of this chapter is to describe training planning as part of the Weapon System Acquisition Process. The first section of this chapter describes the responsibilities and functions of the principal participants: the SPO, ATC and HQ USAF (AF/MP). The using command initiates the process by identifying the Air Force Skill Codes (AFSCs) to be utilized and the tasks to be trained. It is the SPO that has ultimate responsibility for ensuring that the Instructional Development Plan (IDP) is responsive to the needs of the developing system. The next section describes the ISO and identifies the five major activities of the ISD process. The final section of this chapter identifies six potential enhancements for training planning in the Weapon System Acquisition Process. Specific recommendations for enhancing training planning in the WSAP are contained in Chapter VII.

B. Prinicipal Participants

1. SPO

The SPO has primary responsibility for the training program necessary to support its cognizant development program. The primary organization for accomplishment of the SPO training mission is the Training Planning Team.

The Training Planning Team is formed at project initiation and chaired by the program manager. It has responsibility for developing the Training Program Development Management Plan (TPDMP) and other training-related documents produced by the program office.

The TPDMP is a detailed plan which implements the training portion of the PMP and ILSP and forms the basis for the training portion of the IPS. The TPMDP is updated before each program review to reflect changes in milestones or resource requirements.

The TPDMP is used to document the efforts of the Training Planning Team to define training requirements necessary to support the system at each stage in its life cycle. The plan covers employment, operational and support training requirements; it does not cover test and evaluation training requirements.

The TPDMP consists of five major parts. The first part is the program summary which includes a system description and concepts for operation, maintenance, manpower support and military personnel utilization. The second section identifies significant training support issues. The third and fourth sections describe the Instructional System Development Plans for aircrew and skill training. The final section describes the training planning team in terms of composition, plan approval authority, coordinating requirements and organizational relationships.

Training planning at the SPO is frequently done informally and the TPDMP often is not done or is done perfunctorily. The quality of TPDMP is generally determined by the level of interest and leadership shown by the Program Manager.* Recent efforts by AF/MPPT to improve the general quality of the TPDMP have shown promise as extensive review and return of unsatisfactory plans by the Air Staff are resulting in more detailed and responsive efforts. In general, the SPO has the tools to conduct training planning but generally lacks experienced staff necessary to do so. One of the most valuable tools available to the SPO is the Instructional System Development (ISD) process described later in this chapter. The SPO also has available the various training models incorporated in ASSET (see Appendix G) which provide a capability for early assessment of training requirements. These models are usable early enough to provide training input to design and development tradeoff decisions.

2. ATC

The Air Training Command is involved in planning training support for a new system from the initial inception of the system through the end of its operational life in the Air Force inventory. ATC is tasked with defining training concepts, identifying training and training resource requirements, and developing and implementing plans to meet those requirements.

ATC participation in the acquisition process begins with review of the SON. ATC identifies the information it needs from the participating commands and agencies in order to estimate training costs and resource requirements and to plan for alternative solutions. ATC ensures that training considerations are included during the acquisition process and in the system operational and support concept. ATC develops and maintains a training concept which includes types of training proposed and the necessary resource requirements.

ATC provides training specialists, as required, to the SPO. The specialists plan individual training and support and insure that training development occurs in coordination with system development milestones. Though the Program Manager has ultimate responsibility for Instructional System Development (ISD), ATC applies the process to create the actual training program.

ATC develops information on specialized and individual training and on training equipment. ATC also develops related cost estimates for use in life cycle cost projections. In the early stages of system development, these estimates are based in large part on the requirements for training and technical training equipment identified by the contractor. As the system progresses through the phases of the WSAP, and early designs become firmer, ATC becomes more involved in refining training requirements based on assessments of hardware.

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*Requirements for development of the TPDMP were first established in 1981; improvements in quality and responsiveness are expected as experience is gained.

The role of ATC is generally reactive; it is a process of developing training programs in response to training requirements identified by the implementing and using commands. The user identifies the skills to be taught and the Air Force Skill Code (AFSC) structure within which the desired skills should be developed.

ATC maintains a resident office in each of the product divisions within Air Force Systems Command (AFSC). These offices act as liaisons between the SPO and the appropriate ATC activity which will actually develop and implement the training. The resident office gathers data from the SPO, the user and participating commands, reviews it for completeness and forwards it for action to the appropriate ATC activity. The resident office also assists the SPO and user in identifying how requirements should be developed and submitted.

The ATC resident office begins monitoring a specific acquisition program as soon as it receives notification that an SPO has been established. Though it varies from program to program, the ISD process is generally initiated at about the time of Full-Scale Engineering Development (FSED) when a fairly fixed hardware design is available for assessment. The major exception to this is for total aircraft systems when the ISD process is implemented during the Conceptual Development Phase.

ATC generally begins implementation of ISD after FSED utilizing the task and skill analysis provided by the contractor and user. When the system progresses to test and evaluation, the 3306 Test and Evaluation Squadron at Edwards AFB evaluates the system for maintenance training supportability and estimates the suitability of the proposed training program to meet system maintenance requirements. Any variance in task analysis between that identified by the user and that identified during test and evaluation is reconciled between the user and ATC.

ATC utilizes the test and evaluation data to refine the training program. Specialty descriptions and training standards are validated or revised and technical training programs are changed as required. Training for operator and maintenance personnel is planned for, developed and refined as necessary to support operational requirements.

The primary role of ATC is in administering the training program. ATC plans the courses, develops materials, provides the facilities and conducts or contracts for the training. The ATC role is generally restricted to maintenance rather than operator training.

3. HQ USAF (AF/MP)

The Air Staff (AF/MP) has overall responsibility for management of the total Air Force program for training support. This includes reviewing program documentation (PMD, DCP, etc.) to ensure training issues have been addressed and making recommendations for improving consideration of training issues. Within AF/MP, AF/MPPT is the full-time training focus and has responsibility for the development and maintenance of Air Force training policy and regulations and AF/MPPP is concerned with personnel flow for training programs.

AF/MPPT advises and coordinates with the SPO's Training Planning Team and reviews and evaluates the TPDMP. AF/MPPT acts as the ATC focal point on the Air Staff and is responsible for the program element that funds ATC. AF/MPPT also acts as the Air Staff advocate for training equipment requirements. AF/MPPT does not deal strictly with acquisition-related training, but rather addresses the total Air Force training program.

AF/MPPP is responsible for programming the quantitative flow of personnel into skills and sizing personnel flow through courses. AF/MPPP must time the personnel flow in coordination with the rate of build of the inventory and in response to the requirements for training devices; this requires coordination between the user and the Air Staff to insure that system delivery schedules are maintained as current as possible. The other major issues of concern in planning the training flow are the timeliness of receipt of data, the assessment of the AFSC detail and a projection of loss rates and AFSC mixes.

C. Instructional System Development (ISD)

ISD is a systematic process for planning, developing and managing training programs. It is used to identify training requirements, translate those requirements into learning objectives, select the proper training strategy, and provide quality control. Policies and responsibilities for ISD are set by AFR 50-8, Instructional System Development (ISD). AFM 50-2, Instructional System Development, directs the application of ISD principles and processes and describes the concepts and technology involved. Practical guidance in the application of ISD is contained in AFP 50-58, Handbook for Designers of Instructional Systems. Additional procedural guidance has been developed by specialized activities (3066th T&E Squadron, etc.) for procurement of specialized training equipment.

The primary objective of ISD is to create the necessary training program to support system requirements. The standard of merit against which it must be measured is the production of proficient airmen, not course length or content.

HQ USAF (AF/MPP) sets policy for the ISD process and ensures that ISD is used early in system acquisition or modification programs and that funds are budgeted for training programs and devices. The Program Manager, assisted by ATC, is responsible for applying ISD within the individual acquisition program.

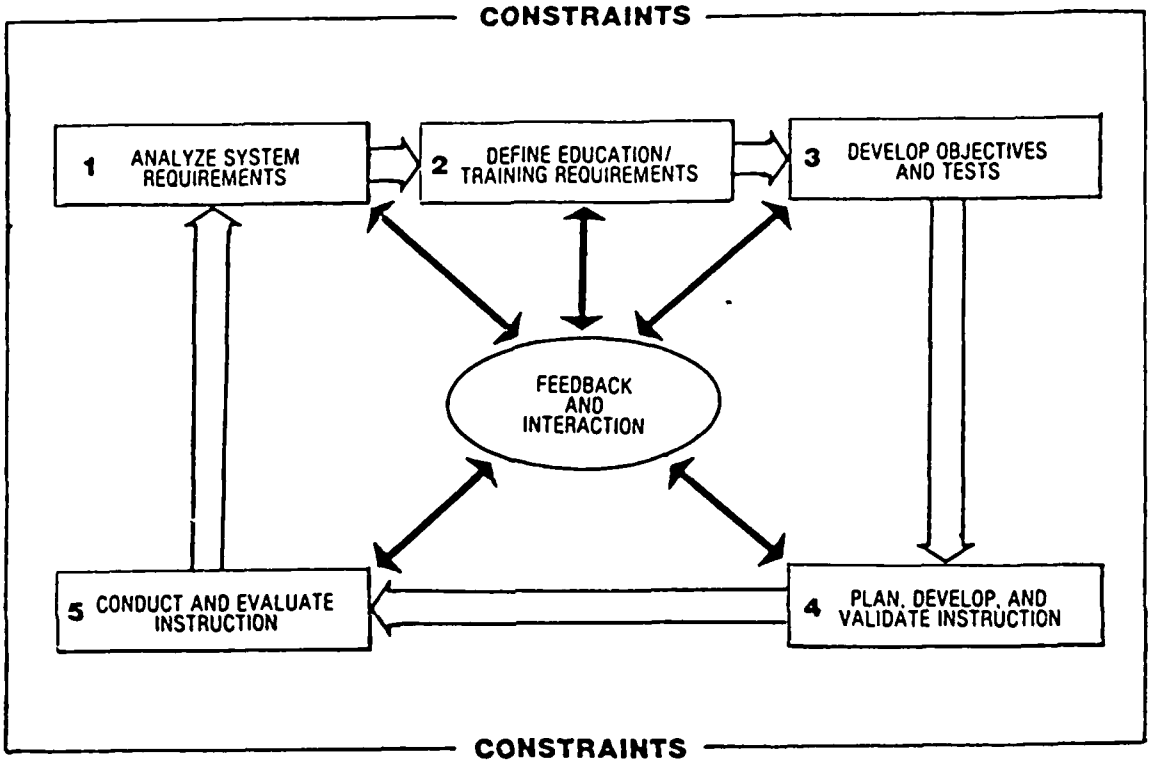
ISD is equally applicable to developing on-the-job training, formal courses, continuation or conversion training, training for new weapons, or any other type of training or education program needed by the Air Force. To quote AFM 50-2, it is, "A deliberate and orderly process for planning and developing instructional programs which ensure that personnel are taught the knowledges, skills, and attitudes essential for successful job performance." The ISD process consists of five major activities which are presented in Exhibit IV-1 and listed below:

- Analyze Systems Requirements;
- Define Education or Training Requirements;
- Develop Objectives and Tests;
- Plan, Develop and Validate Instruction;
- Conduct and Evaluate Instruction.

The analysis of systems requirements is the process of determining job performance requirements in terms of what must be done and how well it must be done. The result is a statement of all human activities which are required for successful performance.

Exhibit IV-1

INSTRUCTIONAL SYSTEM DEVELOPMENT PROCESS



LEGEND

CURRICULUM LOOP ⟹

FEEDBACK AND INTERACTION LOOP ⟺

Source: AFM 50-2

The process of defining the education or training requirements is one of determining the changes needed in skills, knowledge and/or attitudes of personnel to ensure job performance. These changes must be based on the entry level abilities of the personnel to be trained, so that when taken together they will satisfy job performance requirements.

Developing objectives and tests is the dual process of specifying the objectives which must be met by the student to satisfy the training requirements and developing and administering tests which measure attainment of those objectives. Specifically, this involves developing and measuring standards of merit.

Planning, developing and validating instruction is a three-part process. The first part involves the selection of (a) media and methods based on financial, space, and other constraints; (b) the instructional method and presentation mode; (c) the type of learning involved; and (d) the optimum instructional sequence. The second part consists of developing and integrating the materials which will make up the course of instruction. The third part consists of validating the instructional material to insure it accomplishes the learning objectives and revising the course material as appropriate.

The final activity of the ISD process is conducting and evaluating the instructional program. Conduct of the program includes not only the instruction itself, but also scheduling, supporting and training of instructors. The course of instruction is evaluated to determine the level of performance of the graduates in the job environment.

ISD is an important part of the acquisition. It results in the development of skilled, qualified operators and maintainers necessary for maximizing system utility.

D. Potential Enhancements for Training Support

There are several areas in which the effectiveness of training support for new system acquisitions can be enhanced. These include:

- Identification of a focal point for coordinating the integration of system-driven training requirements with manpower and personnel requirements;
- Delivery of training equipment concurrent with or prior to system delivery;
- Earlier involvement in the acquisition process for all new programs;
- Increase resources to support earlier involvement;
- Increase coordination between ATC, the SPO, and the MAJCOMs in the development of training requirements;
- Aggregation and assessment of training requirements.

1. Identification of a Focal Point

Acquisition-related training requirements have no central focus within HQ USAF for coordinating those requirements with the total manpower and personnel package.* Lacking a dedicated advocate, training requirements have a low priority in funding and acquisition decisions. Funds for training requirements are, at times, treated as discretionary and may be used to increase the system buy or may be slipped to prevent cost overruns. For example, tradeoff decisions were made to buy additional F-15s at the expense of training equipment and to buy the C-5B without purchasing any additional training or training equipment. As long as training equipment is budgeted and funded separately from the system it supports, it will be possible to buy the new system without the required training support.**

As there is no central focus responsible for coordinating acquisition-driven training, decisions made which seriously impact the training community are often made into which training input was neither requested nor offered. ATC is responsible for the maintenance of training equipment, however, ATC is not considered a prime spares user and is often omitted from the initial spares purchases.*** Frequently, modification of training devices is not planned for nor budgeted for at the same time as modifications to the operational system. One of the most persistent problems is the late delivery of training equipment and devices, often following rather than preceding the operational system. (See Section F-2 for a further discussion of this problem.)

An example of the low priority given to training equipment is the B-52 ALCM. In April, 1980, funding shortfalls caused ISD to be stopped so that the SPO could be provided with an equipment list which matched available funds. Funding shortages associated with a "fix" of air system problems resulted in the SPO unilaterally reducing the training equipment buy to one Bomb Nav System Resident Trainer. This has resulted in delayed training, insufficient numbers of trained personnel, and the training load being passed on to the field training detachments and SAC.

Regardless of the specific reason, lack of an acquisition training focus contributes to the problem of systems which are operated and maintained by people who are too few in number, too late in arriving or inadequately qualified. The end result of low training priority is reduced readiness.

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*See Chapter III for a discussion of HQ AFSC initiatives in the coordination and management of MPT planning activities.

**During the week of 11-15 October, 1982, a conference was held at Bolling AFB to discuss issues related to training support for systems acquisitions. Among the issues raised were the lack of a training equipment focal point within the acquisition community, the use of training equipment funds for a management reserve and lack of mandatory coordination on training equipment by the SPO with ATC and the user.

***During the period August 1981 to October 1982 there were at least ten provisioning conferences for which ATC did not receive adequate notification to allow for effective participation (See Section F-2).

2. Delivery of Training Equipment

It is a common problem in the training community that training equipment and devices are often delivered well after delivery of the operational system. As mentioned above, this is often a function of low budget priorities and a lack of management attention. However, training equipment delivery is a complex issue not resolved by simply stepping up delivery schedules. Training equipment must be developed in response to system design. Equipment developed and delivered too early may be obsolete at system IOC if major system design changes occur during the later stages of production. This is further compounded by the fact that once project management responsibility transfer occurs, 3600 funds cannot be used for research and development to modify trainers.

One of the major reasons for the late delivery of training equipment is the separate funding of the system and of the training equipment. This allows training items to be slipped or cut while delivery of the system progresses. Funding for training equipment should be an integral and mandatory part of the system budgeting which cannot be unilaterally cut. Inherent in this is a requirement to make training equipment a visible item in the PDP; training equipment funding is currently contained in the aggregate line item Other Support Equipment.

A detailed training and training equipment plan should be included in proposals and as a mandatory line item in prime contracts. Additionally, penalty clauses related to failure to develop and deliver training equipment and support items should be included in the prime contract. More detailed requirements relating to training equipment should be included in the PMD and PMP. Training equipment and training systems development should be a mandatory review item in the DSARC milestone review and approval process for major systems as well as in the appropriate program reviews for non-major systems and modifications.

As mentioned in the previous subsection, training equipment maintenance is often degraded because of nonavailability of spare parts. ATC is not generally considered a prime spares user and is not always included in decisions related to spares procurement; if spares are not available for training, training equipment cannot be properly utilized nor can trained personnel be available to utilize the operational spares. During a 15-month period between August 1981 and October 1982, there were at least ten provisioning conferences held for which ATC did not receive adequate notification to allow for effective participation. Exhibit IV-2 identifies those conferences.

Related to the issue of late delivery of training equipment is the late delivery of logistics support for that equipment. Training devices are often delivered and accepted before the necessary logistics support network is in place; this generally results in awarding of an Interim Contractor Support (ICS) contract for support which should have been provided with the device.

Two of the most significant examples of late delivery of training equipment or devices are the F-100 engine and the GPN-22 Precision Approach Radar. Despite the fact that AFLC/AFSCR 800-24 directs that the first production units of operational equipment and associated support items be allocated for training purposes, it was almost eight years after the introduction of the F-100 engine before a single unit was made available for use in the basic course at Chanute AFB. There was also a corresponding shortage of F-100 engines Air Force wide and ATC priority was not sufficiently high to justify delivery. In addition, lack of engines at training commands exacerbated the engine shortage because a lack of trained personnel increased maintenance time and required the use of operational units for OJT.

Exhibit IV-2

ACQUISITION CONFERENCES LACKING ADEQUATE ATC NOTIFICATION

System	Conference Type	Date	Acquisition Activity
A/S32H-5 A/C Truck	Guidance	Aug 81	WR-ALC
B52 OAS/CMI ATE/SAT	Source Coding	Oct 81	OC-ALC
AN/GSQ-T28 Trainer	Source Coding	Nov 81	OO-ALC
SACDIN	Source Coding	Dec 81	SM-ALC
Inertial Ref Unit	Guidance	Dec 81	SM-ALC
AN/GPN-T4 (V)	Source Coding	Jan 82	OO-ALC
AMRAAM AIM 120	Guidance	Feb 82	WR-ALC
AN/TRC-170	Guidance	Jun 82	SM-ALC
AN/UYK-22	Guidance	Sep 82	SM-ALC
Interoperable Data Link	Source Coding	Oct 82	ESC

The GPN-22 is perhaps the worst example of training support failure to date. Not only was deployment delayed and performance degraded, but a severe lack of trained personnel resulted in removal of the system from use. A lack of training simulators and training equipment required removal of an operational unit from service at Homestead AFB for use in a consolidated hands-on training. The operational demand for serviceable precision Approach Radar eliminated the availability of active units for OJT. The GPN-22 underscores the importance of timely acquisition of training devices and equipment.

Regardless of the reasons, a shortage of training equipment may lead to a decrement in operational readiness. One indication of this is the number of front line aircraft utilized as training equipment. While it will always be desirable to conduct some level of training on actual aircraft, the number of operational aircraft can be significantly increased through timely delivery of training equipment. Exhibit IV-3 shows the number of front line aircraft scheduled for use by TAC as training equipment.

3. Earlier Involvement in the Acquisition Process

AFR 50-8 directs that the ISD process begin during the Conceptual Development stage. However, with few exceptions, the ISD process generally is not instituted until FSED or later. ATC representatives have expressed a reluctance to institute ISD until there is a fair assurance that the program will be procured and there is a firm equipment design with which to work.* At this point the system has progressed far enough to provide manpower, maintenance and operational information firm enough on which to base a stable training program. However, it is probably too late for training factors to influence tradeoff decisions and the whole training program becomes one of reactive support.

The single most important input necessary to ensure effective training support of new acquisitions is the continuous and substantive involvement of the training community in the acquisition process. A training representative experienced in acquisition support (either Air Staff or ATC) is necessary during the early system concept and operational scenario development. This participation will not only give decision makers an assessment of the training impact of new skill or personnel utilization requirements, but will also provide the training community with early warning of the type of training support they will be tasked to provide; such early warning is not currently provided to the training community.

A strong statement and specific guidance with specific milestone requirements delineated related to the training program should be included in the PMD. All other early program documentation should make specific reference to training requirements and specific training support requirements should be included in requests for proposals.

As directed in AFR 50-8, the ISD process and identification of training equipment requirements should begin in the Conceptual Development Phase. Early training requirements decisions should be based on the same rough assumptions, analogies, and comparisons as other system decisions, progressing with greater confidence as system development progresses. A training concept should be one of the required products of the Conceptual Development Phase. Developing this concept should be made easier by using the training models contained in the ASSET program (Appendix G) which facilitate early assessment of training requirements. Early conceptualization has two distinct advan-

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*ATC representatives at HQ AFSC and ASD at Wright-Patterson indicate this reluctance is a result of limited resources.

Exhibit IV-3

FRONT LINE AIRCRAFT SCHEDULED FOR USE AS TRAINING EQUIPMENT

(TAC)

	F-15	F-4	F-16	A-10	F-111
AVERAGE AIRCRAFT PER DAY	27	32	22	12	14
FLYAWAY COST ($M)	19	7	9	6	28
VALUE OF CURRENT INVESTMENT IN MAINTENANCE TRAINING DEVICES	510	208	198	73	374

(OVERALL TOTAL = 1,365)

NOTE: FOLLOWING COSTS EXCLUDED:

-- MAINTAINING THESE AIRCRAFT AS TRAINING DEVICES

-- COSTS OF OPERATING AIRCRAFT AS TRAINING DEVICES (EG: FUEL FOR ENGINE RUN)

Source: AF/MPPT

tages; first, it provides a continuous "real-time" picture of system-driven training requirements based on the most current system data available and it provides this picture early enough to be of use in tradeoff decisions. Second, it provides planners with information to project gross level long-range requirements and conduct long-range training supportability assessments.

4. Increased Resources to Support Earlier Involvement

ATC reluctance to participate in the acquisition process during the early phases is not due to an inability to apply ISD during those phases. The nature of the ISD process is such that it can be initiated when a basic system concept exists and there is sufficient detail upon which to base the necessary assumptions. The reluctance is, rather, the result of the husbanding of scarce ATC resources. ATC currently has neither the staff, facilities nor the funds to provide ISD analysis for the myriad "what if" design alternatives which occur during system development or the equally large number of system concepts which never progress to procurement. ATC does not even have the resources to fully support fielded systems on which current readiness depends.* Prudent management requires ATC to concentrate its resources on deployed systems, systems currently being deployed, and finally on those programs with the highest probability of procurement and the least requirement for speculation as to the nature of operational and maintenance requirements.

Delayed implementation of ISD results in a lack of training participation in the tradeoff decisions which occur while discriminating among the various design options. Training participation then becomes primarily reactive, planning for and developing the resources required to support a specified system design. If there is to be meaningful training participation in system development, training involvement must begin during the conceptual phase when there is maximum latitude in design options.

When making recommendations for enhancing earlier participation by the training community, one assumption is implicit. The assumption is that earlier participation is of significant importance to justify increased resource commitment toward that end. While it is recommended here that earlier training participation be increased, the first step toward this objective is a firm decision to commit the resources necessary (personnel and financial) to accomplish the desired activities. An attempt to undertake earlier participation without the concomitant resource allocation will require the reallocation of resources currently committed to other important functions and will not increase the overall capability of ATC to support the acquisition program.

5. Increased Coordination During Training Planning

Recent initiatives on the part of AF/MPPT have improved the coordination between the Air Staff and the SPO. Earlier contact between the Training Planning Team and AF/MPPT has resulted in earlier and more effective training planning management and more complete TPDMPs. Insistence by AF/MPPT has, in some cases, caused the establishment of a de facto training focus within the SPO.

Though coordination between the SPO and the Air Staff has been greatly improved, a similar improvement is necessary in the coordination between the SPO and ATC; responsibility must rest primarily with the SPO as tasked in AFR 50-8. ATC repre-

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*Based on statements provided by HQ ATC and AF/MPP.

sentatives at ASD indicate that they begin monitoring a program as soon as they are notified that an SPO has been established and they likewise visit the SPO to familiarize appropriate personnel with ATC functions.

Although ATC is tasked with supporting training planning for new systems, the program manager should have ultimate responsibility for all support requirements for the new system. Placing this responsibility in the SPO can assure that training support is not delayed because of the inability of ATC to identify or track the developmental status of the many programs in the WSAP. HQ ATC will need to ensure that all Program Managers are familiar with the tasks and time requirements associated with training support.

Despite ATC initiatives, all SPO personnel interviewed during preparation of this report indicated a lack of understanding of the ISD process and of the proper role of ATC in the procurement process; most indicated that they tended to defer all training-related matters to ATC. In an extreme case, one DPML indicated that he was aware that the ISD process existed but that he was not sure what it was and his ILS Manager had never even heard of ISD. Although a major component of that program was less than two months from a production decision, neither the DPML nor the ILS manager knew what the status of the training planning was or even if it had begun at all. The ILS Manager responded by saying, "If it has to be done, I'm sure ATC has done it." While in this case ATC had in fact begun the ISD process, such a lax attitude on the part of the SPO indicates a lack of understanding of the importance of training to operational readiness, of the long lead time necessary for some training programs and specifically of the requirements of AFR 800-8 which assign the Program Manager responsibility for the training and training equipment ILS elements. The end result may be the fielding of a major system without the necessary training support.

6. Aggregation and Assessment of Training Requirements

The most pressing problem facing the training community in the near future is not the discrete determination of the optimum training program for an individual system; it is, rather, the allocation and distribution of scarce resources across the total Air Force training requirements. To effectively deal with this problem, managers require a method of identifying and aggregating all Air Force-wide system-specific training resource requirements.* There is no currently available method for identifying weapon system training requirements within the POM; as a result it is difficult to assess the adequacy of training resources programmed to support the entire Air Force acquisition program. Likewise, there is no available method for aggregating and assessing the outyear (post FYDP) training requirements for new systems under development. Ultimately, the possibility exists that the Air Force may procure new systems whose aggregate demand for training resources is greater than the Air Force is capable of providing.

A tag for weapon system training requirements is needed to identify resources programmed in the POM. A capability to aggregate this information and to identify total training resources programmed for each year of the POM is required in order to allow for adequate management oversight. Additionally, there should be a capability to aggregate those training requirements for outyears which have not yet fallen within the POM. (At a minimum this would be ten years to correspond with the Extended Planning Annex.) These outyear projections are important in conducting supportability assessments. Once a system falls within the POM period, it is generally too late to have significant impact on training requirements.

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*Data required by AFR 50-8, Attachment 1, would provide a basis for aggregation.

CHAPTER V

PERSONNEL PLANNING IN THE ACQUISITION PROCESS

A. Introduction

Personnel planning during systems acquisition is a process of developing the resources necessary to support identified manpower requirements. It involves procurement, classification, development and utilization of personnel. Put simply, it is the function of "matching faces to spaces."

The personnel community has two major roles to play in the acquisition process. The first role is in classification; this includes developing and managing new career fields and Air Force Specialty Code (AFSC) shredouts necessary to operate, support and maintain new systems. The second role is in personnel support; this includes procuring, classifying, and managing the personnel resources necessary to satisfy the system-driven manpower requirements. In addition to discussing these two roles, this chapter will also identify potential areas for enhancing personnel planning during the acquisition process. The conclusion of this chapter emphasizes the need for these potential enhancements of personnel planning.

B. Classification

Classification of manpower requirements necessary to support new weapons systems is performed by the using Major Command's (MAJCOM's) functional Office of Primary Responsibility (OPR) (e.g. aircraft maintenance) in conjunction with that MAJCOM's manpower shop. Classification is based on an analysis of tasks necessary to support the new system and a comparison of those tasks to existing Air Force standards.

If the requirements necessary to support the new system can be supported within the existing AFSC structure and the using MAJCOM's manpower authorizations, the affected MAJCOM's manpower shop develops a manpower profile against the AFSC shredout done by the functional OPR*; AFMPC is advised of the new assignment requirements. If new AFSC shredouts are required to support the system, a request for change must be submitted to AFMPC for staffing and approval.

AFR 39-1 stipulates that such requests for changes in Air Force Specialty Shredouts may be made twice yearly at prescribed times, and that they are to be submitted to HQ AFMPC/MPCRPQ. These specialty shredouts are a list of suffixes and corresponding types of weapons or equipment. They are appended to selected Air Force Specialty (AFS) descriptions and codes (AFSCs) to describe equipment specializations. For example, an Airman Missile Systems Analyst Specialist may be noted as a qualified specialist in the BGM-109 Ground Launched Cruise Missile (suffix C) or in the LGM-25 (suffix F).

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*Based on information provided by AFMPC/MPCRP personnel, there are some problems associated with MAJCOM functional OPR identification of AFSC requirements. Tasks are not always well matched to the AFSC shredout assigned and may require either a different AFSC or a new shredout. Such misassignment is generally identified by the MAJCOM manpower shop or through field reporting of the job performance of technical school graduates. Suitability of AFSC assignment is assessed by AFTEC or by a subsequent AFMEA management survey.

AFR 39-1 and AFR 35-1 govern the submission of AFS shredout changes. Submissions for change are to occur when occupational analysis indicates that AFS shredouts are inadequate or incomplete. A rationale is to be included in the recommendation for change, along with (a) descriptions of its relationship to the existing classification structure, (b) the details of the weapon, (c) any engendered new training requirements, and (d) its impact on existing manpower and personnel requirements. Impact is to be specifically quantified in terms of the number, location, organization level and AFSC's of the anticipated affected positions. In addition, the impact description is to include either estimates of the number of current personnel expected to be converted under the shredout change or estimates of the number of new personnel who would be required.

Once received, AFMPC staffs the proposed change through Air Staff functional areas, other MAJCOMs which may be affected by the change and through AF/MP manpower and personnel planning sections. This results in a unified Air Force position on the proposed shredouts.

If approved, the AFSC shredout changes are distributed by HQ AFMPC/MPCRPQ to the field 45 days before taking effect. This allows users an opportunity for preconversion planning. Specific concersion actions related to such conversions are recommended by HQ AFMPC/MPCRA at the time of distribution.

C. Personnel Support

The primary role of the personnel community during the acquisition process is to plan for, recruit, classify, assign and manage the people necessary to operate, maintain and support the new system.

An important function of personnel planning is the development of a projected force structure designated by grade, occupational specialty and year of service. The projected force structure represents an integration of authorizations and of personnel policies necessary for effective force management. Effective personnel management requires relatively stable personnel policies; frequent changes in policy lead to career instability and to a corresponding decrease in morale and retention.

The Air Force manages its enlisted force by year of service and grade structure. Career force profiles are developed by AF/MPX for approximately 120 career progression groups (groups of occupational specialties) and for the entire force. These career force profiles are responsive to authorizations and thus are affected by any large scale changes in system-related manpower requirements.*

AFMPC assigns personnel to Air Force commands and bases in accordance with funded requirements and resource availabilities. In general, resources are distributed proportionally to commands based upon requirements. Personnel shortages and skill

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*A detailed description of the Air Force personnel system is contained in Rand Corporation Report R-2429-AF, Air Force Manpower, Personnel and Training: Roles and Interactions, B. Armstrong and S. C. Moore, June 1980.

shortages are generally distributed to support activities in order to improve manning in operational units.* Distribution of personnel is based on five major criteria:

- Total manning within AFSCs;
- Authorized command priorities;
- Operational efficiency;
- Career development objectives;
- Force stability and cost effectiveness.

D. Potential Enhancements for Personnel Support

There are several areas with potential for enhancing personnel support during the acquisition process. Among these are:

- Earlier involvement of the MPT community in the acquisition process;
- Identification of a focal point for coordinating the integration of system-driven manpower, personnel and training requirements;
- Establishment of formal procedures for reporting manpower and training requirements;
- Development of contractor and SPO incentives for effective early estimates of manpower and training requirements;
- Aggregation of the total Air Force-wide acquisition-related manpower and training requirements for the out years (post FYDP).

Personnel support for new systems is driven in large part by the manpower requirements and the training requirements created by those systems. Each of these potential areas for enhancing personnel support is indirectly discussed in Chapters III and IV respectively. These discussions will not be repeated here.

E. Conclusion

Effective management of a stable enlisted force requires long-term planning and management. The current practice of identifying manpower requirements at or after DSARC II review does not always provide sufficient lead time to allow for effective

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*Within the Air Force, there are priority commands which will receive 100 percent of authorizations prior to proportional distribution to the remaining commands and bases.

personnel management. Short lead time often results in short tours and necessitates retraining to support new requirements.*

Almost any required force structure can be supported if the personnel community is given sufficient lead time. A greatly expanded end strength can be supported given sufficient time to procure and process personnel and to "grow" the necessary NCOs. New skills can be accommodated given sufficient time to establish training courses, train instructors and develop the training pipeline. Increased aptitude requirements can be supported given adequate time to develop and implement the necessary compensation, procurement and retention policies.

Most important for ensuring effective personnel support for the acquisition process is early identification and reporting of manpower requirements. Failure to fully identify requirements until they have entered the POM process contributes to unnecessary turbulence in the personnel system. Aggregation of out year (post FYDP) manpower requirements created by new systems provides a basis for projecting force structure and for developing corresponding personnel policies and plans on a long-term basis. At the Air Staff level the personnel community needs to know the detailed manpower requirements for new systems in order to effectively provide personnel planning. Personnel planning must take place before the manpower community begins programming those requirements. Manpower and personnel are complementing disciplines and their effective interaction early in the acquisition process will enhance weapons system supportability and contribute to a stable force structure.

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*A prime example of short lead time on personnel support is the E-3A. For a variety of reasons, manpower requirements were continually refined during OT&E and following deployment. During the early stages of deployment, personnel assigned were often below the skill level or proficiency level authorized.

CHAPTER VI

THE EFFECTS OF THE OPERATIONAL SCENARIO AND THE MAINTENANCE CONCEPT ON MPT DETERMINATION

A. Introduction

The purpose of this chapter is to briefly describe how the development of operational scenarios and the development of maintenance concepts impact MPT determination in the Weapon System Acquisition Process. This chapter initially describes how operational scenarios are developed and the role of MPT in their development. The next section discusses how maintenance concepts are developed. The final section provides selected examples of how shifts in operational scenarios can affect both maintenance and non-maintenance MPT requirements.

B. Operational Scenario Development and HQ USAF Level MPT Participation

Initial scenario development is a joint activity between HQ USAF (AF/RD is initial OPR), the implementing command (usually AFSC) and the using command (e.g. TAC, SAC, etc.). AF/RD remains the OPR for the operational scenario until DSARC III review, at which time AF/MPM assumes responsibility. AFMEA reviews the operational scenario beginning at Milestone II and evaluates its effect on maintenance manpower requirements. AFTEC and AFMSMET also participate in scenario review.

There are two prime drivers of the operational scenario: (1) the assessment of the mission of the system in terms of the threat to be countered; and (2) the operational capability of the system to be developed. The mission of the system is defined in terms of operational deficiencies in the ability of existing (or anticipated) systems or forces to counter existing (or anticipated) threats. This deficiency is identified through mission area analysis. The threat is defined in terms of (a) capabilities to be countered, (b) methods in which those capabilities may deny Air Force mission success, (c) the environment in which the threat operates, and (d) the timeframe through which the threat is expected to exist. Threat data are contained in a Threat Environment Description (TED) report which is prepared by the implementing command and approved by the Assistant Chief of Staff for Intelligence (AF/IN). The TED includes sufficient threat data from which to accomplish interactive analysis of system engineering, survivability and vulnerability analysis, threat simulation test and evaluation, security decisions, and technology exploration.

The operational capability is partially defined by the mission statement in terms of the threat the system must counter and the asks it must perform. These requirements establish general guidelines for the desired performance of the new system. The operational capabilities of the system in turn place practical limits on the missions it can realistically perform as defined by such performance parameters as speed, climb rate, range and munitions load. The final operational scenario must include the optimum combination of mission attainment and obtainable operational capability.

The operational scenario is constantly refined as the new system becomes better defined. Such elements as maintenance level and site requirements, resupply time, sortie rate, weather limitations, ground alert and battle damage estimates are added to better define the system's operating environment. The operational scenario is maintained throughout the development and operational life of the system. It is used to project changes in manning, spare stockage, maintenance requirements, and other support elements which are affected by changes in operational policies.

HQ USAF level MPT participation in scenario development is generally limited to post Milestone III activities when MPM assumes OPR for the operational scenario. While MAJCOM MPT personnel may be involved in early development, they lack the Air Force-wide perspective of MPT resources and requirements which is present at the Air Staff level. As currently practiced, the MPT role is primarily one of identifying MPT resources to support requirements identified in the operational scenario. MPT has no substantial role in shaping those requirements.

While it is not necessary that AF/MP have the pre-Milestone III OPR role, it is important that there be MPT input into the early decisions which shape the operational scenario. In particular, MPT participation is important during the logistics support planning phase of the scenario development when decisions are made on maintenance and support requirements for the new system. This will help ensure that an operational scenario is not developed which cannot be supported by projected Air Force MPT resources. This also will give the MPT community sufficient lead time to react to new or demanding scenarios which require innovative approaches. An additional benefit of early MPT participation is that it allows the Air Staff to identify programs with MPT requirement projections that do not reflect the program's current operational scenario.

C. Maintenance Concept Development

Maintenance concept refers to the maintenance factors and parameters which define the constraints and objectives posed by maintenance on the new system. The maintenance concept is seen as an integral part of the System Operational Concept (SOC) and is part of that documentation. It evolves into a maintenance plan which guides logistics support planning during the later stages of the acquisition process. The ultimate goal of the maintenance concept is to ensure the production and continued use of mission ready systems at the lowest possible cost.

AFR 66-14 directs that maintenance concept development is to begin early in the Conceptual Phase (between Milestone 0 and I) of a systems acquisition, and is to be included in the acquisition process up through Milestone II. The preliminary maintenance concept is prepared by the using command and is included in the Preliminary System Operational Concept (PSOC). During the Demonstration and Validation Phase, the maintenance concept is prepared by the using command and AFSC and is incorporated into the System Operational Concept (SOC) document. After Milestone II, the maintenance plan is developed from the maintenance concept. It is incorporated into the Integrated Logistics Support Plan (ILSP) and is revised as necessary.

MPT does not participate in the development of the maintenance concept. Rather, Air Force Specialty Codes (AFSCs), skill levels and tasks are determined by the using command logistics maintenance manpower branch, in conjunction with AF/LEY.

During the Conceptual Phase of the acquisition process, the preliminary management concept is used to aid in the selection and design of the new system. Basically, the maintenance concept provides R&M indications of how proficient the new system will be in performing its mission. Conversely, the early design and mission of the new system influences the preliminary maintenance concept.

The preliminay maintenance concept consists of specific maintenance objectives and constraints stated in terms of the maintenance environment (basing, weather, expected organizations) and the program decision factors. The latter are estimates of Full Mission Capable (FMC) rates, Sortie Generation Rates, Mission Completion Success Probabilities (MCSPs), and Maintenance Personnel Per Operational Unit. Of these, the

latter is the sole manpower-related factor. The maintenance manpower to be considered in this factor, however, is not all inclusive. AFM 26-3, Mission Equipment Maintenance Operations, determines the manpower categories to be considered.

During the Demonstration and Validation Phase of the acquisition process, trade-off studies are conducted to further explore possible trade-offs between the maintenance concept and the system design. Trade-off decisions are influenced by Optimum Repair Level Analyses (ORLAs) which are part of Logistic Support Analysis (LSA) and which attempt to optimize operational support while lowering costs. (In the A-10 acquisition program, manpower maintenance program estimates were developed by the use of LCOM.) Any changes to the maintenance concept are made through the combined efforts of the using command, AFSC, AFLC and AFTEC.

The Program Management Factors prepared during this phase of maintenance concept development include such non-manpower items as Mean Time Between Maintenance and such manpower-related items as Maintenance Manhours Per Flying Hour (MMH/FH), Maintenance Manhours Per Sortie (MMH/S), and Maintenance Manhours Per Operating Hour (For Ground Systems). All three manpower-related factors are intended to include only those manhours associated with productive and direct maintenance. Supervisory, security police and other non-maintenance personnel are not included. Maintenance requirements are developed at this time in terms of thirteen factors specified in AFR 66-14. Among these are repair locations, support equipment, ground support operations and integrated logistics support elements. Ultimately, the ILSP includes detailed plans for maintenance support requirements based on the previous maintenance concept work. (See Chapter II for a discussion of the ILSP.)

D. Selected Examples of the Effects of Operational Scenario Changes On Maintenance Concepts and On MPT Requirements

Equipment design is not the only, or in some cases even a primary, driver of MPT requirements associated with new acquisitions. The operational scenario and maintenance concept can have significant impact on MPT needs, particularly at the total aircraft level. Such items as sortie rate, bed down requirements and maintenance manhours per flying hour (MMH/FH) factors may greatly influence the requirements for manpower. It does little good in terms of reducing manpower requirements to greatly reduce the direct maintenance associated with new equipment if bed down or policy (e.g. "open-door") requirements create a significant requirement for non-productive stand-by time.

Maintenance-related MPT requirements are not the only ones affected by the operational scenario. A scenario shift from a single to a multi-based mode would increase the demand not only for direct maintenance personnel but for such support personnel as administrative, medical, and security police (especially where nuclear capable units are involved). While these latter are not system-specific requirements, they do represent a draw against total Air Force manpower assets and must be planned for in order to control excessive growth and to ensure effective management.

The A-10 system acquisition program illustrates the significant effect that scenario changes can have on MPT requirements. In November 1973 a scenario provided by TAC was used as a baseline in order to form MMH/FH projections. When the scenario changed in September of 1975, the MMH/FH increased from 12.8 to 23.0, far beyond the original maintainability objective of 12.0. This change involved a shift from a one location to a two location deployment and an alteration in the sortie rate and flying duration. In addition to the substantial increase in direct productive maintenance require-

ments, the new scenario added significantly to the number of overhead and security maintenance personnel. Had they been included in the projections, these security and overhead personnel would have amounted to 165 personnel for one combat-ready A-10 wing in CONUS.

The MX missile program provides a good example of the impact an operational scenario can have on non-maintenance MPT requirements. Selection of the horizontal shelter basing concept, as opposed to existing silos, dense-pack, or one of the other options under consideration, would have created excessive demands for security police and would have required reprogramming of resources away from other important programs; in fact, this scenario probably would have been unsupportable given the current and projected security police career field structure.

The Ground Launched Cruise Missile (GLCM) provides an example of how an operating scenario can have significant effect on personnel areas such as assignment and rotation. The GLCM has associated with it AFSCs that are unique to the system. The current operating scenario calls for the GLCM to be deployed only in Europe. Thus, when personnel within these unique AFSCs are due for CONUS rotation, they must be assigned outside their overseas imbalance skill area. This requires dual training. As a result, highly skilled technicians do not optimize their overseas or CONUS skills because of the necessary readjustment between occupational fields following each reassignment.

The B-1 program provides an illustration of how a politically controversial system may be subject to frequent changes in operational scenario and may cause large perturbations in manpower requirements. The B-1 had been deleted from the budget, along with all manpower and training resources, only to be resurrected by the present administration as the B-1B. While the MPT community has little or no control over, or participation in, such political decisions, MPT planning must begin as soon as possible. Such programs reappear well into the Full-Scale Development Phase of the acquisition process and do not allow for the normal progression of MPT planning and programming. Similarly, the MX missile has several politically volatile basing modes, each with widely diverse manpower requirements. Until a political decision is made, the most conservative MPT estimates are programmed in order to minimize the impact of additional program slippage; if one of the more demanding scenarios is then adopted, the programmed requirements will have to be adjusted in the subsequent POM submissions. As for the B-1B, production is already under way and all of the maintenance AFSCs and task training requirements have not yet been identified.* While early participation may not eliminate such problems for all politically sensitive systems, every effort must be made to mitigate their impact.

Development of the operational scenario and maintenance concept can commit a large portion of the system-related MPT requirements before a formal design is undertaken. The MPT community must participate actively in developing these concepts.

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*Lack of skill and task identification is in large part due to incomplete or "black box" designs for many of the major avionics and ECM components. As design progresses, skill and task identification will likewise progress.

CHAPTER VII

MPT SUPPORTABILITY IN THE ACQUISITION PROCESS

A. Introduction

One of the greatest challenges for defense acquisition planners lies in ensuring supportability of new weapon systems. Equipment being procured as part of the Weapon Systems Acquisition Process (WSAP) is often at the leading edge of technological development and, thus, requires new or greatly enhanced skills for the most effective operation. The manpower, personnel, and training (MPT) planner faces the formidable task of identifying required skills, procuring qualified personnel, and planning and conducting the necessary training so that man and weapon provide a timely and effective addition to force readiness.

The central issue for the MPT planner is the "supportability" of new weapon systems acquisitions. Will sufficient, quality personnel be available? Are current or planned training facilities adequate? Is the projected force composition ideal for effective utilization? Does the proposed system adversely affect the resource availability of other systems under development or in the inventory? In sum, will the projected MPT assets be adequate to support deployment and utilization of this new system and other systems?

MPT supportability is an issue of increasing importance to the Secretary of Defense (SECDEF), the Defense Science Board (DSB), and the Under Secretary of Defense for Research and Engineering (USDRE). On 25 February, 1983, the Secretary of Defense issued a memorandum for Secretaries of Military Departments, on the subject of the DSB Summer Study on Training and Training Technology (1982), in which he "approved the recommendations made by the Defense Science Board to improve training by applications of technology." One of the specific recommendations called for the service to "require use of contemporary analytical methodology such as Navy HARDMAN to match hardware to people."

MPT supportability is also an issue of increasing importance to the Air Force. The Acquisition Improvement Initiatives (30 April, 1981, Carlucci Memoranda) have stressed the importance of supportability during system acquisitions. Further, MIL-STD-1388-1A (25 Jan 83) requires an assessment of projected MPT supportability of new systems.

MPT supportability should be as important as the operational capability of the hardware. A weapon that cannot be manned or maintained provides no combat capability. The very term "weapon system" implies the synergistic relationship between man and hardware; neither is capable of accomplishing the desired mission without the other.

MPT supportability is defined in relation to individual systems and their location in the acquisition process. Prior to Milestone I, the important MPT supportability issues are related to operational scenarios, maintenance concepts, and design evaluation. As the system progresses through development, the important issues progress in level of detail and analytical effort required. Skill levels and tasks must be determined, manning levels established, and training requirements determined. As the system approaches Milestone III, MPT supportability planning progresses to actual implementation of training courses and assignment of personnel. The key element in MPT supportability throughout the WSAP is timeliness. Sufficient and reliable MPT data must be developed at the appropriate times to allow for adequate planning, program development, and resource allocation. No system is inherently unsupportable from an MPT standpoint. However, its MPT

cost may exceed the Air Force's desire to pay, or its deployment schedule may not allow the necessary time to develop adequate plans and programs. Only timely development of MPT data can ensure effective consideration of these issues.

MPT supportability consists of four major elements:

- Policies and Procedures;
- Organization;
- Analytical Models;
- Information System.

Exhibit I-1 is a graphic representation of these elements as they combine to create MPT supportability.

The following subsections discuss each of these components and their relationship to MPT supportability.

B. Policies and Procedures

The base upon which the entire MPT supportability concept must be built is effective policies and reporting procedures. MPT supportability traditionally has not been an area of great concern to the Systems Program Office (SPO), and manpower has not been a serious constraint in the system's development process. The effect of poor MPT planning on the operational capability of the new system is not an area for which the program manager is normally held accountable. Explicit consideration of MPT requirements early in the WSAP will create new procedural requirements for the SPO and will establish a new criterion against which the program manager can be evaluated.

Enhanced MPT participation will require firm policy guidance. Such policy must be explicit as to form, content, and timeliness and must have top-level support. Policy without the overt support of senior decision makers will not be effective in implementing changes.

Accompanying policy must be a specific set of reporting procedures that identify what is to be accomplished, describe various means of accomplishing it, and establish standards against which such efforts are to be evaluated. The procedures must be sufficiently uniform to ensure that the information developed allows meaningful comparisons between systems and is suitable for use in assessing MPT supportability.

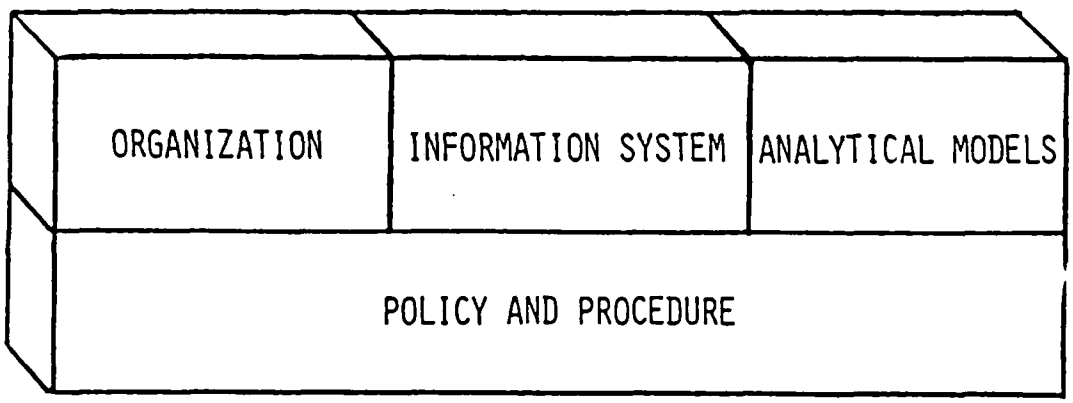
C. Organization

The most effective way to ensure that policy is properly applied is to designate a specific organization(s) as responsible for its application. The organization(s) will provide both management oversight and technical support.

The management oversight function will be one of monitoring the application of policy and assessing its effectiveness in enhancing MPT participation in the acquisition process. The organization responsible for management oversight will also recommend modifications to policy in order to improve its utility and to ensure that it reflects current Air Force needs and requirements. The organization must ensure that policy remains dynamic and that it is a positive influence on MPT supportability rather than a hindrance.

Exhibit VII-1

MPT SUPPORTABILITY CONCEPT



The organization responsible for technical support must assist in application of policy and procedures; it must be able to direct program managers to the information and support necessary for the performance of their MPT functions. The organization should also be a clearinghouse for all technical information related to MPT participation in the acquisition process. The technical support function relates to the SPOs and product divisions. It must have the ability to advise the SPOs and product divisions on manual procedures, analytical models, and information systems available to support MPT planning. Further, it should participate in MPT research efforts and act as a catalyst in the development and dissemination of new tools and techniques.

D. Analytical Models

When policy and organization have been defined, established, and institutionalized, the program manager will need to have access to analytical models and methodologies for developing relevant MPT information. Analytical models and methodologies encompass automated and manual techniques and collectively provide the SPOs and product divisions with the tools to develop the requisite information. The models and methodologies must be sufficiently standardized so that comparability among all Air Force systems may be obtained. Furthermore, our research has indicated that additional analytical capability is needed.

The analytical models and methodologies work at the individual system level and have two primary uses. First, they are used as decision-making aids during acquisition tradeoff decisions; they are used to project, compare, and assess the relative MPT costs of various design options, operational scenarios, and maintenance concepts; and they are used to identify the most affordable and supportable options.

The second principal use of analytical models and methodologies will be to provide input data for long-term MPT supportability projections that will form a basis for the development of necessary plans and programs for both personnel and training. The longer the lead time allowed, the more supportability problems can be minimized.

The Air Force currently has a number of valuable models and methodologies, including LCOM (see Appendix E), ASSET (see Appendix G), ISD, and MEP (see Appendix F), that are currently not being used to the greatest degree possible. Though each of these potentially could benefit from additional enhancement, they do provide the Air Force with a significant capability. These analytical models and methodologies, along with those used for aggregation and assessment (see Chapter X, Task 9) will provide the basis for an Air Force capability that will use contemporary analytical methodology to match hardware to people.

E. Information System

The fourth major component of MPT supportability is the information system. It provides an analytical capability for assessing and aggregating the data developed by the analytical models and methodologies for the various weapon systems in the acquisition process. The information system will provide a comprehensive picture of system-driven MPT requirements for the Air Force acquisition program.

The information system is the basis for assessing MPT supportability. Requirements for newly developing weapon systems will be integrated with the requirements for existing systems in order to identify total Air Force system-driven requirements. These requirements will then be compared with projected MPT assets in order to evaluate the MPT supportability of new systems.

The information system will also facilitate evaluation of the impact of modifications or replacement equipment on existing MPT demand. It will facilitate aggregate grade and endstrength management and career group progression. In addition, aggregate, long-term data will enhance MPT planning and will provide justification for funding and implementation of the necessary MPT programs.

F. Conclusion

The Air Force has expressed interest in applying contemporary analytical methodology to assess and aggregate the MPT supportability of new weapon systems acquisitions and their impact on existing and future MPT requirements. This methodology is more than just a computerized information system. To be effective, it requires significant amounts of data, provided by numerous sources, that come together in a timely and usable fashion.

This information can only be compiled if effective policies and reporting procedures are in place to support the development, flow, and consolidation of necessary information. The policy and procedures by themselves do not produce the requisite information. An organizational structure that advocates the application of the policy and procedure by the SPOs and product divisions must exist. This organizational structure must be able to provide the needed technical resources, as well as be the MPT advocate in the WSAP.

The existing and emerging Air Force MPT analytical models and MPT information systems that will produce and provide much of the MPT data required for supportability assessment and aggregation must be uniformly utilized to ensure the maximum flow of the most recent available data. Finally, the analytical models and methodologies that utilize this information within the information system must be developed and put in place.

Based upon this solid foundation of policy and procedures, organization and analytical models, supportability assessment and aggregation will have a profound impact on MPT planning; as a result, new weapon systems acquisitions will provide timely and effective additions to force readiness.

The following chapter presents 9 recommendations for enhancing MPT participation in the WSAP. Implementation will result in enhancements to existing MPT involvement in the WSAP and will also put in place the basic foundations for MPT supportability assessment and aggregation. The final two chapters of this report present an implementation plan for putting these nine recommendations in place.

CHAPTER VIII

RECOMMENDATIONS

A. Introduction

The purpose of this chapter is to present nine recommendations for enhancing MPT participation in the acquisition process. These recommendations form the basis for a comprehensive plan of action. Additionally, they provide a framework for the implementation of the supportability concept described in Chapter VII.

Each recommendation is presented with a brief discussion of the needs that it satisfies, its advantages and disadvantages, and the results expected if it is implemented. The nine recommendations are:

1. Consolidate and Enhance Regulations and Develop Procedures to Enhance MPT Reporting Requirements.

2. Define Requirements for and Establish Organizational Focal Points for Acquisition-Related MPT Matters.

3. Prepare MPT Acquisition Manager's Handbook and MPT Technical Handbook.

4. Provide the SPO with a MPT Analytical Capability.

5. Develop Techniques and Define Requirements to Enhance MPT Participation in the Development of Operational Scenarios and Maintenance Concepts.

6. Determine the Proper Role of AF/MP in Current Contractor Incentive Initiatives.

7. Enhance the Visibility of MPT Requirements in the POM Process.

8. Enhance Transfer of MPT Technology from the Laboratory to the Field.

9. Develop MPT Assessment and Aggregation Capability.

Exhibit VIII-1 is a matrix that illustrates the interdependency of the nine recommendations, i.e., if recommendations listed down the left hand side of the matrix are not implemented they will adversely affect the implementation of those recommendations listed across the top of the matrix. Exhibit VIII-2 is a matrix that illustrates the relationship between the implementation of each of the recommendations and the concepts of MPT supportability as described in Chapter VII.

Exhibit VIII-1

INTERDEPENDENCY OF RECOMMENDATIONS

	Recommendation 1	Recommendation 2	Recommendation 3	Recommendation 4	Recommendation 5	Recommendation 6	Recommendation 7	Recommendation 8	Recommendation 9
Recommendation 1		●	●		●		●	●	●
Recommendation 2				●	●	●	●	●	●
Recommendation 3	●			●	●			●	●
Recommendation 4		●	●		●			●	●
Recommendation 5	●	●				●		●	●
Recommendation 6	●	●			●				
Recommendation 7		●				●			●
Recommendation 8			●	●	●				●
Recommendation 9		●	●		●		●		

Exhibit VIII-2

RELATIONSHIP BETWEEN MPT SUPPORTABILITY

AND RECOMMENDATIONS FOR ENHANCING

MPT PARTICIPATION IN THE WSAP

	Recommendation 1	Recommendation 2	Recommendation 3	Recommendation 4	Recommendation 5	Recommendation 6	Recommendation 7	Recommendation 8	Recommendation 9
Policy And Procedures	●	●	●	●	●	●	●	●	●
Organization	●	●	●		●	●	●	●	●
Analytical Models	●		●	●				●	●
Information System	●	●	●	●	●		●	●	●

RECOMMENDATION 1

Consolidate And Enhance Regulations And Develop Procedures To Enhance MPT Reporting Requirements

A. Recommendation

Issue a consolidated AFR assigning requirements and responsibilities for acquisition-related MPT activities; enhance MPT policy guidance in existing regulations; implement separate MPT reporting procedures with specific reporting requirements at each acquisition milestone.

B. Need

Governance of MPT participation in the WSAP is included in at least 39 different DoD Directives, DoD Instructions, Military Standards, Air Force Regulations and Headquarters Operating Instructions. Many of the PMs and DPMLs interviewed during this study indicated that they were neither aware of specific information regarding MPT involvement in the WSAP nor of where that information could be located. At the present time duplication of effort is required to provide individual actions for programs requiring guidance. The lack of information concerning required documentation and guidance for MPT participation precludes participation of the MPT community in early design tradeoff considerations or in operational scenario or maintenance concept development. This lack of consolidated information and guidance detracts from efficient management of MPT planning for new systems and limits MPT capabilities for making long-term projections.

The complexity of the acquisition process, the need for earlier MPT involvement in the process, and the requirements of acquisitions on the MPT resources of the Air Force, necessitate more sophisticated planning and control techniques. This in turn means greater reliance on information in order to facilitate increased responsibility and managerial activity. At the current time MPT documentation is incorporated into numerous reports. The MPT content of these various reports is not aggregated for the program, is not housed as a single unified source of information, nor is it presented with a uniform content and format. No formal procedures exist which detail timing for reports that would allow for effective MPT participation in tradeoff decisions. Air staff generally does not receive detailed MPT data for major systems until after DSARC II, or for nonmajor systems until the POM submission. Additionally, there are no formal procedures for reporting MPT considerations between the SPO and the MAJCOM, and program documentation that is developed frequently does not provide sufficient manpower requirements information upon which to base early personnel and training planning decisions.

C. Advantages

Provides consolidated MPT guidance for acquisition programs and a ready reference of requirements, activities, and source material. Provides high visibility for MPT requirements; facilitates aggregation of MPT requirements; encourages detailed MPT assessments; facilitates direct contact between the SPO and various staff sections charged with acquisition-related MPT functions.

D. Disadvantages

Requires preparation coordination, and staffing of a new regulation. Adds to an already large number of regulations governing the acquistion process. Creates additional reporting requirements. Separates MPT requirements from other programmatic data.

E. Results

As a result of this effort three things will be accomplished: regulations will be consolidated; policy guidance will be enhanced; and a consolidated source of information concerning all required reporting will be developed. Consolidation of the regulations will improve overall management of the MPT planning process by providing a single uniform source of information for program guidance. Enhancement of policy guidance provided in this consolidated regulation will eliminate the need for providing individual actions for each program requiring guidance for MPT participation in the acquisition process.

The consolidated policy reporting procedure will result in enhanced MPT management, AFSARC and DSARC review and decision making, early MPT involvement in design tradeoff decisions, early MPT participation in development of operational scenarios and maintenance concepts, and an increased visibility of MPT requirements in the Program Decision Package (PDP). Additionally this effort may also be used to enhance the transfer of MPT technology from laboratory to field (Recommendation 8) and may also be incorporated into the MPT Acquisition Manager's Handbook (Recommendation 3).

RECOMMENDATION 2

Define Requirements For And Establish Organizational Focal Points For Acquisition-Related MPT Matters

A. Recommendation

Establish two separate but related focal points for MPT participation in the acquisition process: policy focal point to be located in AF/MP; and operational focal point to be established in AFSC/AL.

B. Need

There is currently no single Air Force organization specifically tasked with dealing with acquisition-related MPT issues. Interviews conducted as part of this study indicated that SPOs deferred to MAJCOMs on MPT issues, and that there are certain Air Force-wide issues which the operating commands (usually MAJCOMs) either lack perspective to deal with or that are beyond their control. Because there is no central focus responsible for coordinating MPT involvement in the WSAP, (a) manpower planning, training planning, and personnel planning often receive low priority or may be overlooked; (b) limited MPT planning beyond the FYDP is accomplished for some systems but not for others; (c) aggregation and assessment of Air Force-wide requirements during the out years (post FYDP) cannot be accomplished; (d) coordination and management of acquisition-driven manpower, personnel, and training decisions are, at best, difficult; and, (e) decisions that seriously impact on the MPT community are often made without MPT input being either requested or offered.

C. Advantages

Provides a focus for monitoring, reviewing, and integrating acquisition-related MPT issues; designates the MPT operational function as an area of responsibility for the primary acquisition implementing command; removes an additional staff layer and provides more direct access to the SPOs; the newly-created Acquisition Logistics Directorate within AFSC headquarters is currently tasked with acquisition-related MPT policies and plans and would not require major reorganization to accomplish the function; AFSC is able to interact with the using commands (TAC, SAC, etc.) as an equal without the difficulties involved in Air Staff tasking and reporting; internal AFSC management may encourage early reporting of MPT estimates by SPOs because such estimates remain "in-house." Policy matters, on the other hand, would be dealt with at the Air Staff level, and at a higher level of visibility.

D. Disadvantages

Necessitates creating two organizational units which require staffing and development of clear lines of authority and communication.

E. Results

As a result of this effort, acquisition-related MPT focal points will be created. These focal points will serve as a point of contact for SPOs, MAJCOMs, AFTEC, AFMPC, ATC and other applicable commands and agencies. These focal points will monitor the status of all Air Force acquisition projects that could affect the MPT

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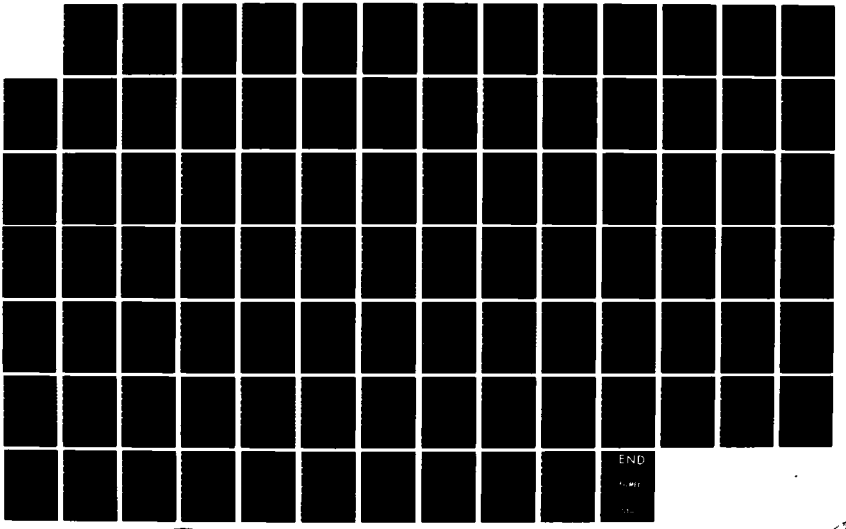

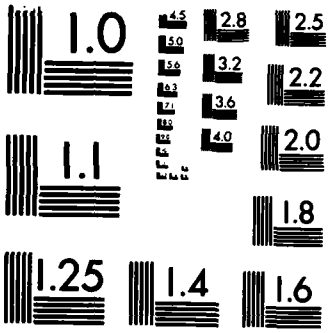

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community, will aggregate and assess long-term requirements, and will coordinate overall MPT involvement in the acquisition process.

RECOMMENDATION 3

Prepare MPT Acquisition Manager's Handbook And MPT Technical Handbook

A. Recommendation

Prepare two handbooks that will provide acquisition managers, MPT technical staff and concerned agencies, with a complete and readily available source of information and instructions to fulfill their MPT responsibilities.

B. Need

Currently there is no primary reference guide to MPT policies, responsibilities, and requirements for SPO Program Managers, Deputy Program Managers for Logistics or MPT technicians. In addition, there is no consolidated source of information concerning analytical methodology, tools or models available for use by MPT technician. Finally, discussions with concerned agencies during preparation of this study have identified the need for additional analytical tools, algorithms and models for assessing acquisition-related MPT requirements.

C. Advantages

Provides a primary reference guide for regulations, responsibilities, and analytical tools and gives current and future SPO MPT analysts the step-by-step instructions needed to carry out specific MPT responsibilities. In addition these handbooks will facilitate the transfer of MPT technology from the laboratory to the field.

D. Disadvantages

Requires initial development cost· increases requirements for reporting system-related MPT requirements data; requires issuance and maintenance (updating) of handbooks; requires development of additional MPT tools.

E. Results

This effort will result in the preparation of two handbooks and additional MPT analytical tools. The MPT Program Manager's Handbook will serve as a primary reference guide to MPT policies, responsibilities, and requirements for SPO PMs and DPMLs and concerned agencies. The MPT Technical Handbook will provide current step-by-step instructions for carrying out MPT analysis. Additional analytical tools and algorithms identified as needed to perform MPT assessments will be developed and included in the handbooks.

RECOMMENDATION 4

Provide SPO With An Analytical Capability

A. Recommendation

Establish a cadre of manpower, personnel, and training analysts within select Major System and AFDAP SPOs. Establish a cadre of analysts within each product division that can provide on-call service to program managers of programs that do not justify resident analysts.

B. Need

Critical MPT determinations made during the acquisition process depend on the availability of properly skilled analysts. The SPO's need for competent, experienced analysts arises when the SPO develops source selection criteria, conducts comparability analysis to assess the desired level of manpower impact on design concepts and engineering proposals, formulates the maintenance concept, utilizes LCOM simulations, and applies MEP-derived standards or ASSET. Program managers currently do not have an adequate MPT determination capability through a formally assigned group of resident or on-call analysts. Rather, the SPO must depend upon the analytical support of the participating commands during the different phases of the acquisition process. Evidently, this analytical support has been seriously lacking, contributing to inadquate and untimely MPT requirement assessments of many WSAPs. To make MPT estimates more reliable and more timely, a readily available analytical capability is needed by the SPOs and product divisions.

C. Advantages

Provides project managers with a readily available source of MPT analysis; facilitates early and continuous MPT analysis for each system under acquisition; provides for economy of resources by concentrating resident capabilities in areas of greatest use and servicing all other requirements from a central, on-call capability.

D. Disadvantages

Requires trained MPT analysts not currently available within the SPOs or the product divisions; requires reprogramming of manpower spaces to create recommended capability.

E. Results

Implementation will result in a cadre of skilled resident MPT analysts being provided to SPOs of major WSAP and AFDAP programs. For smaller acquisition programs, requiring a much lower volume of MPT requirement assessment activity, a cadre of skilled on-call analysts within the product divisions, in proportion to their needs, will be provided. Project managers and product divisions will consequently have a readily available analytical capability which will facilitate early, reliable and continuous MPT analysis for each system under acquisition. Earlier MPT projections will, in turn, allow more lead time for planning and other MPT activities that support new systems. In addition, MPT requirements will be more effectively considered during design tradeoff decisions as a result of increased MPT analysis brought about by the availability of skilled analysts.

RECOMMENDATION 5

Develop Techniques And Define Requirements To Enhance MPT Participation In The Development of Operational Scenarios And Maintenance Concepts

A. Recommendation

Amend AFRs to include MPT participation in all phases of operational scenario and maintenance concept development review. Develop new methods and identify existing technologies that could be used by MPT personnel to successfully evaluate the size and nature of the impact of alternative operational scenarios and maintenance concepts on future manpower, personnel, and training requirements.

B. Need

Maintenance manpower requirements are largely determined during the conceptual stage of an acquisition program when operational scenarios and maintenance concepts are being formulated and design tradeoff decisions are being made. Because MPT participation in developing and reviewing the operational scenarios and the maintenance concepts is currently very limited, the impact of manpower requirements on design tradeoff decisions is also very limited. Consequently, manpower requirements may be programmed that are excessive or unsupportable given future personnel resources. MPT participation can provide an important but unrealized Air Force-wide perspective of manpower requirements and resources during the time when it can affect the design of the system. Another current shortcoming which could be remedied by MPT participation in the development of operational scenarios and maintenance concepts is the current exclusion of indirect, support requirements from early manpower projections. Experience has shown that requirements for these personnel can quickly multiply as operational scenario and maintenance concept changes are made. Therefore, they should be taken into account. MPT participation will remedy this shortcoming.

C. Advantages

Facilitates early identification of large manpower requirements; facilitates early identification of potential new skill requirements; provides MPT input into tradeoff decisions; increases lead time for MPT planning purposes; facilitates assessment of MPT supportability; facilitates identification of nonsystem specific MPT requirements.

D. Disadvantages

Increases staffing and review requirements for operational scenarios and maintenance concepts.

E. Results

The MPT community will increase participation in the development and review of operational scenarios and maintenance concepts. Appropriate analytical tools will be developed to help the MPT community perform actively and effectively in this role. Greater MPT participation in the development of operational scenarios and maintenance concepts will facilitate early identification of manpower requirements and of new skill requirements. Lead time will increase for MPT planning purposes. Finally, identification

RECOMMENDATION 6

Determine The Proper Role Of AF/MP In Current Contractor Incentive Initiatives

A. Recommendation

Strengthen the role of manpower, personnel, and training factors as source selection criteria through increased visibility and weight during proposal evaluation. Incorporate penalty clauses in production contracts to limit allowable (unpenalized) growth of direct labor manhour estimates not associated with Air Force directed changes in design, performance characteristics, operational requirements, or maintenance concepts.

B. Need

MPT requirements currently are given a very low weight during the source selection process of major weapons systems acquisitions. MPT criteria visibility is also diminished because these criteria are subsumed under logistics criteria that also contain many non-manpower related elements. Since MPT requirements have such low weight and visibility, the chances of MPT playing a significant role in the selection of sources are indeed small. There is little pressure on contractors to produce accurate manpower and skill level projections as a result of their low weight. Consequently, contractor-provided manpower estimates tend to substantially understate manpower requirements as they will actually exist in the Air Force. By the time accurate estimates are developed through the corrective actions of Air Force analysts, the opportunity for MPT to influence the hardware design may have passed, and the Air Force may be forced to meet unacceptably high manpower demands for the system. Long-term MPT planning is also obstructed until accurate acquisition-related manpower estimates become available. There have not been strong incentives, either positive or negative, to induce contractors to provide accurate and acceptable manpower estimates in proposals.

C. Advantages

Encourages early consideration of MPT support requirements. Facilitates effective life-cycle cost analysis. Facilitates early manpower supportability assessments. Encourages inclusion of MPT support considerations in early design options; encourages development of reliable, early MPT estimates; encourages control of MPT requirements growth during the design process.

D. Disadvantages

May encourage intentional understatement of MPT requirements to improve selection potential; may result in reduced operational capability to satisfy MPT constraint considerations; measures of merit for evaluation of reliability of MPT proposals are difficult to develop; responsibilities for MPT growth will be difficult to assess; presence of penalty clauses may inhibit competition.

E. Results

The Air Force MPT community will participate in current DoD and Air Force efforts to develop contractor incentives. This could result in (1) making specific recommendations for the enhancement of MPT criteria development methods and on MPT scoring systems; (2) suggesting new source selection ranking systems that would

strengthen the weight of MPT criteria; and, (3) developing MPT contractor incentive language for RFPs. Strengthening MPT's role in source selection criteria would facilitate the improvement of MPT estimates provided by contractor proposals, and would aid effective life-cycle cost analysis, early supportability assessments, and the inclusion of MPT support considerations in early design tradeoff.

RECOMMENDATION 7

Enhance The Visibility Of MPT Requirements In The POM Process

A. Recommendation

Implement effort currently under development in AF/LE to include the PDP of each participating command as an information addendum to the PDP of each of the others; thus, the implementing, using and supporting commands, while separately processing their own PDPs through the current Air Force panel structure, will be cognizant of the PDPs of the other participating commands. Develop a budget tag for associating training requirements with corresponding weapons systems or acquisition programs during the POM process.

B. Need

The total MPT requirements necessary to accomplish development, deployment, operation, maintenance, and support of an acquisition are not programmed through a single PDP submission. Operational and direct support manpower are programmed in the user's PDP; logistics support manpower is programmed in the AFLC submission; R & D program manpower is included in the AFSC submission. As a result, the total funding of MPT requirements of an acquisition cannot be ensured; a new system may be funded without some or all of its MPT support requirements; hardware requirements may in fact compete against their own support requirements for funding. Aggregation, coordination and management of total MPT requirements for an acquisition is, at best, difficult under the current system.

Recently AF/MPPT, which acts as Air Staff advocate for training equipment requirements while addressing the total Air Force training program, has initiated efforts to improve the quality of the TPDMP developed by the SPO. However, AF/MPPT does not deal strictly with acquisition-related training and training planning. As a result, training planning at the SPO is frequently done informally; the TPDMP is often not done, or it is done perfunctorily. Another problem recognized by the training community is that training equipment and devices are often delivered well after delivery of the operational system. This is a function of low budget priority and lack of attention to training requirements by SPO management; training equipment is generally funded apart from the rest of the system. As such, training items may be slipped, or even cut, while delivery of the system progresses. AFLC/AFSCR 800-24, which directs that the first production units of operational equipment and associated support items be allocated for training purposes, lacks uniform compliance. The net result of these problems is that some front line aircraft are scheduled for use as training equipment, and that some systems are operated and maintained by people who are too few, too late in arriving, or inadequately qualified. The worst examples result in reduced readiness, or, as in the case of the GPN-22 Precision Approach Radar, withdrawal of an operational system from use because of inadequate numbers of trained personnel due to a lack of training simulators. Most of these problems could be diminished if appropriate attention is given to training and training planning as part of the WSAP. This can be facilitated by developing a budget tag for associating training requirements with corresponding weapon systems or acquisition programs during the POM process, and by increasing the visibility of MPT requirements in the PDP.

C. Advantages

Retains current procedures for preparing and processing PDPs; provides cross-visibility of MPT requirements in the PDP; provides a single picture of system-related MPT requirements; encourages cross-command support of the total system-related MPT requirements; facilitates using command assessment of the adequacy of MPT resources planned and programmed by the implementing and supporting commands. Facilitates assessment of the adequacy of training requirements; facilitates identification of training requirement shortfalls; facilitates aggregation of system-related training requirements; facilitates long-term training supportability assessments for new systems.

D. Disadvantages

Does not provide a single decision authority for system-related MPT requirements; may allow disapproval of development or support requirements without participation of the using command. Establishes an additional reporting requirement during the POM process.

E. Results

As a result of this effort MPT requirements in the Program Decision Package (PDP) and POM will receive increased visibility. This will facilitate programming of all MPT requirements to support the development, deployment, maintenance and operation of acquisitions. Implementing, using, and supporting commands will be cognizant of the PDPs of the other participating commands. The aggregation and assessment of total MPT requirements for each program will be facilitated, as well as the aggregation and assessment of total Air Force-wide acquisition-related MPT requirement projections. Specific financial attention will be given to training in the PDP; SPO managers will therefore show more interest in training requirements and accordingly produce a better quality TPDMP. This, in turn, will enhance ATC participation in the acquisition process, facilitate AF/MP management responsibilities for total Air Force training support, and enhance delivery of training equipment in accordance with AFLC/AFSCR 800-24.

RECOMMENDATION 8

Enhance Transfer Of MPT Technology From Laboratory To Field

A. Recommendation

Establish an OPR for MPT technology transfer; include directions for MPT technology utilization in the PMD; consolidated MPT technology information for use by the SPO; require the SPO to report on the applicability and utilization of MPT technology.

B. Need

The Air Force is a leader among the services in possessing and developing the technologies and analytical tools used to determine early manpower requirements for acquisition programs. Despite this, difficulties exist in transferring the appropriate technology from the laboratory to the intended user in the field. Existing user organizations, both at the Air Staff and SPO levels, do not have a specific organizational framework for transferring technology from the lab to the field. This causes sub-optimal utilization of these tools. Often, user organizations are not aware that these tools exist, or when they are aware they apply them improperly. As a result, the effectiveness of MPT participation in the early phases of the acquisition process becomes limited, thus limiting the impact of MPT parameters on design and development decisions. Untimely or poor MPT estimates, caused by inadequate use of technology, also lead to delayed or inaccurate MPT estimates in the POM, and handicaps long-range personnel and training planning.

C. Advantages

Facilitates transfer of technology from the laboratories to the acquisition community; encourages effective utilization of existing MPT technology; ensures that the SPO is aware of existing MPT technology; facilitates assessment of the effectiveness of MPT technology; encourages and promotes development of MPT technology.

D. Disadvantages

Requires issuance of new regulations or modification of existing regulations; creates new reporting requirements; creates a new organizational unit.

E. Results

An OPR will be established for the purpose of assuring that MPT assessment technology is transferred to SPO and product division users, and is properly applied. At the same time the OPR will ensure that technologies being developed suit users' needs. These goals will encourage more accurate and timely manpower assessments, and thereby facilitate MPT influence on design and development decisions and aid long-range manpower, personnel, and training planning.

RECOMMENDATION 9

Develop MPT Assessment And Aggregation Capability

A. Recommendation

Develop an automated capability for aggregating and assessing MPT data, and implement identification of total manpower requirements associated with the acquisition of new systems.

B. Need

The Air Force currently has no method for aggregating and assessing the total demand for acquisition-related MPT requirements during the out years (post FYDP). This shortcoming is especially significant in that there is no capability for assessing the impact of these requirements on Air Force management of accessions, skills, grade structure, end strength or training facilities. As a result of the inability to identify long-range macro level requirements, there is no capability for assessing Air Force requirements against projected resources in order to develop the necessary plans and programs for personnel training that would ensure that future force structure will be capable of supporting Air Force-wide system requirements.

The Air Force currently has effective tools for projecting the MPT requirments associated with individual systems. There is not, however, a corresponding set of tools for aggregating and assessing the MPT impact of the entire acquisition program during the out years. While it is possible to assess the MPT ownership costs of individual systems, these assessments are made in isolation. Currently it is not possible to assess either the MPT ownership costs of the entire acquisition program or the relationship of any individual system to the entire program. A capability is needed to identify and aggregate the long-range MPT requirements associated with both new and existing systems. Quantitative and qualitative MPT requirements should be associated with the acquisition program and should be identified in relationship to the year in which they are required. This capability should be for fairly long projections, a minimum of 15 years, to correspond to the five years of the FYDP and the ten years of the extended planning annex (EPA). Further, methodologies should be developed for comparing the total acquisition-related MPT requirements to resource projections in order to evaluate Air Force-wide MPT supportability of the acquisition program and to assess the impact of individual system requirements on the supportability of the entire program.

While traditional methods used for determining requirements for new systems such as maintenance manhours per flying hour, have been generally effective in assessing the requirements associated with operations, maintenance and logistics support, non-system specific manpower, such as cooks, clerks and medics, has historically not been subjected to close scrutiny. Non-system specific manpower is generally allocated based on a formula developed from past experience with similar aircraft types. This approach is satisfactory as long as basing and bed down concepts and maintenance concepts are similar to past utilization. When radical new concepts such as remote basing and satellite air fields are implemented, a virtually hidden demand for manpower overhead is created. This demand may not always be recognized during the early tradeoff decisions and may result in funding of a system with a much higher manpower cost than anticipated.

Total manpower requirements associated with the acquistion of new systems should be identified and included in an Air Force capability to compare the total acquisition related MPT requirements to resource projections made to evaluate Air Force-wide MPT supportability of the entire acquisitions program.

C. Advantages

Facilitates aggregation of total new system MPT requirements; facilitates integration of requirements for both new and existing systems; facilitates assessment of net system-driven MPT requirements; provides support for planning long-range personnel and training requirements; provides a basis against which to evaluate the MPT impact of proposed system designs and concepts; facilitates projections of long-term MPT growth trends.

D. Disadvantages

Requires additional analysis and planning during the design and development of new systems; has significant initial development cost; increases requirements for reporting system-related MPT requirements data.

E. Results

This effort will result in early identification of the total manpower requirements created by the introduction of new systems, as well as a capability to assess near-range (0-7 years), intermediate-range (to 15 years) and long-range (to 30 years) MPT supportability of the Air Force acquisition program. It will provide the ability to identify the total MPT requirements associated with both individual systems and the aggregate acquisition program. It will result in identification of requirements by year in terms of skill level, AFSC, and workload for each system under development by the Air Force. It will also identify the student load, instructor load, training devices and training equipment necessitated by each system. It will facilitate analysis of the impact of proposed systems on projected MPT assets. It will facilitate a comparison of resources freed through the retirement of existing systems with those requirements created by new systems. In sum, this system will facilitate long-range planning for manpower, personnel, and training programs and will provide support for force structure decisions.

CHAPTER IX

IMPLEMENTATION PLAN FOR ENHANCING MPT PARTICIPATION IN THE AIR FORCE ACQUISITION PROCESS

A. Introduction

This chapter presents an overview for the implementation of the nine recommendations for enhancing manpower, personnel, and training (MPT) participation in the acquisition process. Each recommendation was developed to deal with specific MPT functional requirements for acquisition support. A corresponding implementation task was developed for each recommendation. The nine implementation tasks are:

- Task 1: Consolidate and Enhance Regulations and Develop Procedures to Enhance MPT Reporting Requirements;
- Task 2: Define Requirements for and Establish Organizational Focal Points for Acquisition-Related MPT Matters;
- Task 3: Prepare MPT Acquisition Manager's Handbook and MPT Technical Handbook;
- Task 4: Provide the SPO with an MPT Analytical Capability;
- Task 5: Develop Techniques and Define Requirements to Enhance MPT Participation in the Development of Operational Scenarios and Maintenance Concepts;
- Task 6: Determine the Proper Role of AF/MP in Current Contractor Incentive Initiatives;
- Task 7: Enhance the Visibility of MPT Requirements in the POM Process;
- Task 8: Enhance Transfer of MPT Technology from the Laboratory to the Field;
- Task 9: Develop MPT Aggregation and Assessment Capability.

This chapter presents a summary of the estimated level of effort for the nine implementation tasks and a Gantt Chart depicting the time phasing of each. The level of effort estimates are divided between "Contractor/Air Force personnel effort" and "Air Force personnel effort." The former represents a level of effort that could be performed by either contractor or Air Force personnel. The latter represents a level of effort that can only be performed by Air Force personnel. Estimates of the human resources required after implementation are presented. Additionally, a discussion of the anticipated benefits of implementing these recommendations is included.

B. Estimated Level of Effort

The estimated level of effort to accomplish the entire implementation plan is approximately 15 manyears (178 manmonths).* This includes 137 manmonths of contractor/Air Force personnel effort and 41 manmonths of Air Force effort. Exhibit IX-1 identifies the estimated level of effort for each of the nine implementation tasks.

The implementation effort is expected to extend over a 48-month period with approximately 75 percent of the tasks being completed during the first 21 months. Exhibit IX-2 is a Gantt Chart depicting a hypothetical time phasing of each of the nine implementation tasks.

C. Human Resource Requirements after Implementation

Total human resource requirements after implementation are hard to predict until further investigation is completed. There are three tasks which require human resources after implementation. They are: Task 2, Establish Organizational Focal Points; Task 4, Provide SPO with Analytical Capability; and Task 9, Develop MPT Assessment and Aggregation Capability.

Task 2 requires staffing for two focal points. The policy focal point in AF/MP will require five to seven offices in grades of O3, O4, and O5 and one clerical person. The operational focal point in AFC/AL will require five to eight officers in grades O3, O4 and O5, seven to twelve enlisted personnel, and two clerical people.

Task 4 will require 12 to 15 enlisted spaces Air-Force wide to establish an initial resident analtyical capability for SPOs. Within each of the five product divisions, the on-call analytical capability will require an officer-in-charge (grade O3 or O4) and seven to ten enlisted personnel. A survey of each product division will be necessary to ascertain their specific requirements.

Task 9 will require the one officer in the grade of O3 or O4 on a one-quarter to one-third time basis to act as system manager and one full-time level-five enlisted data technician to provide continued use of the assessment and aggregations system.

All human resources required by implementation of these recommendations will not necessitate authorization of new spaces. A portion of the requirements will be met through resources already available within the Air Staff, HQ AFSC, and the various product divisions. This will be accomplished through reorganization and consolidation of

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*Manmonth estimates for Air Force level of effort are based on standard Air Force workweeks and manhour availability charts as designated in AFR 26-1 (Vol. III). The standard used in this report is 145.2 hours per month available to primary duty, based on a normal work week for CONUS assigned military personnel. A manyear of effort is based on 12 standard manmonths. Manhour availability for contractor personnel is slightly higher than for Air Force personnel; however, for purposes of comparison, the standard 145.2 hours per month will be used in both instances. A manmonth of effort refers to the quantity of work that must be accomplished, not the number of people required to perform it. For example, a 12-manmonth effort does not of necessity require one person full-time for a year; it may be accomplished by six people working full-time for two months, or by one person working half-time over 24 months.

Exhibit IX-1

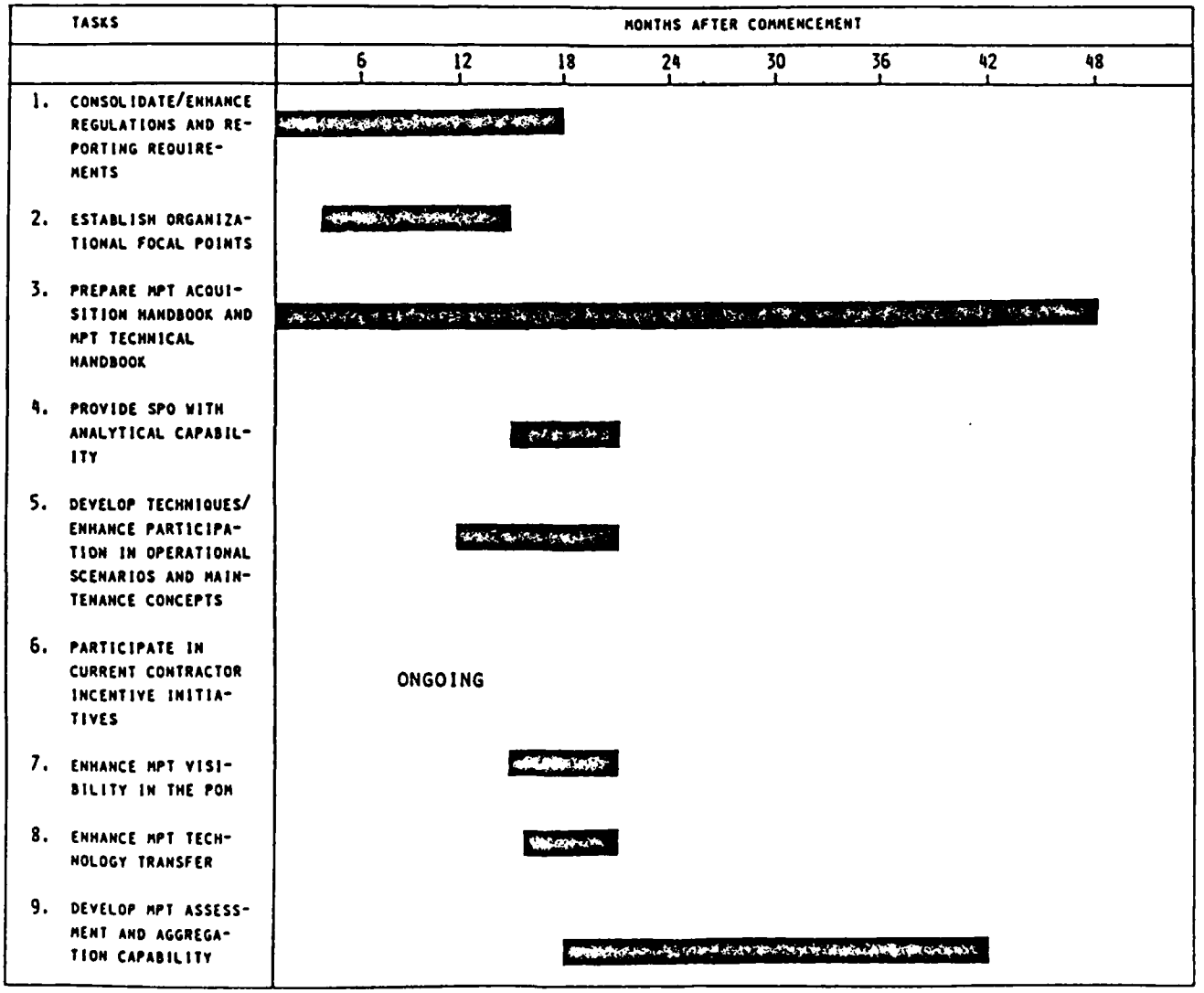
CONSOLIDATED LEVEL OF EFFORT AND TASK DURATION

TASKS	MANMONTHS OF EFFORT		DURATION
	CONTRACTOR OR AIR FORCE	AIR FORCE	MONTHS AFTER COMMENCEMENT
1. CONSOLIDATE/ENHANCE REGULATIONS AND REPORTING REQUIREMENTS	18	6	18
2. ESTABLISH ORGANIZATIONAL FOCAL POINTS	5	4	12
3. PREPARE MPT ACQUISITION HANDBOOK AND MPT TECHNICAL HANDBOOK	66	6	48
4. PROVIDE SPO WITH ANALYTICAL CAPABILITY	2	2	6
5. DEVELOP TECHNIQUES/ ENHANCE PARTICIPATION IN OPERATIONAL SCENARIOS AND MAINTENANCE CONCEPTS	6	2	9
6. PARTICIPATE IN CURRENT CONTRACTOR INCENTIVE INITIATIVES			ONGOING
7. ENHANCE MPT VISIBILITY IN THE POM	1.5	2.5	6
8. ENHANCE MPT TECHNOLOGY TRANSFER	1	2	5
9. DEVELOP MPT ASSESSMENT AND AGGREGATION CAPABILITY	48	15	24
TOTAL	147.5	39.5	48

Exhibit IX-2

IMPLEMENTATION GANTT CHART

Hypothetical Time Phasing of the Nine Implementation Tasks



responsibilities with augmentation of new spaces provided where existing resources are not sufficient. It is estimated that 30 to 40 percent of the requirements created by these recommendations will be provided by existing resources.

D. Anticipated Benefits

MPT planning for the long-term is often difficult to accomplished because of the pressing need to deal with immediate problems. While it is widely recognized that many near-term problems are the result of insufficient long-term planning, it is difficult to generate interest in long-term planning activities that will benefit future planners at the expense of dealing with the problems at hand.

A common misbelief concerning long-term MPT planning is that it accrues benefits only when it has been applied to conceptual weapon systems which are nearing initial operating capability (IOC). While it is true that maximum results are achieved by long-term planning when system design and support requirements are most flexible, the implementation of these recommendations will have immediate positive benefits in addition to the future benefits normally expected from effective long-term planning.

The implementation of these recommendations will provide assistance to the on-going management of MPT resources and will allow long-term planning to occur as a natural and logical flow of events, not as an additional burden on already overtaxed MPT planners. As the long-term of today becomes the near-term of tomorrow, the full value of this program will be realized in the form of improved MPT resource utilization and reduced life-cycle support costs.

1. Near-Term Benefits

The implementation of these recommendations will provide the Air Force with significant near-term benefits. For the purposes of this report, near-term benefits are those which accrue during the Program Objectives Memorandum (POM) period immediately following completion of the implementation. The primary near-term benefits of implementation are:

- Consolidated and uniform policies and procedures;
- Improved quality of MPT data available for planning and programming.
- Improved personnel management and force stability.
- Increased visibility of training requirements.

The most immediate result of this program will be a set of uniform policies and procedures for MPT analysis and planning during the acquisition process. Personnel tasked with MPT functions will be provided with consolidated guidance and readily available sources of assistance. A dedicated focus for MPT policy and operational requirements will ensure that regulations reflect current requirements and will monitor MPT performance.

Air Staff level MPT planners will receive timely identification of MPT requirements and will be able to aggregate those requirements to analyze total MPT demand. The data will facilitate analysis of MPT assets programmed in the POM and will allow for more accurate projections of resource requirements throughout the POM period. This

will provide an earlier identification of shifts in resource requirements and will allow for smoother transition of resources between Air Force commands.

Systems Program Offices (SPOs) and product divisions will be provided with the resources necessary to conduct MPT planning. A cadre of MPT analysts will be established and handbooks that will provide the necessary tools for developing accurate and timely information needed for MPT planning will be developed. These tools will enable the SPOs to provide improved data to MPT planners and managers. This data will be of value not only to long-range planners, but also to managers who must deal with daily questions of immediate MPT resource allocation.

Implementation of these recommendations will allow development of more accurate and timely MPT data. Standardized methodologies will ensure that MPT data are uniformly developed. This will facilitate comparability and will enhance MPT life-cycle cost estimates and MPT participation in tradeoff decisions.

Earlier development of MPT data will allow enhanced MPT participation during the conceptual phase of the WSAP. MPT planners will be able to have an immediate impact on design, maintenance concepts, and operational scenarios. Resulting improved force structure projections will have an immediate beneficial effect on management of, and planning for, personnel requirements.

Implementation of these recommendations will assist personnel planners in developing five-year projections of the requirements and authorizations needed to build the force structure. It will improve career group management through early identification of requirements. This, in turn, will enhance projected requirements for grade restructuring, career progression adjustments, training/retraining, and selected promotion needs. It will provide MPT planners with the information necessary to adjust authorizations, redesign career fields and plan retraining requirements. Implementation will also aid in reducing short-touring and gapping of authorized spaces by providing sufficient lead time to plan assignments consistent with the requirements for unit manning and individual stability.

Training planners will benefit from improved information flow and interaction with the SPOs and product divisions. The information produced by implementation of these recommendations will facilitate timely design and development of training courses, development and delivery of training equipment and training pipeline planning. The visibility of training requirements will be increased and, thus, the tendency of SPOs to utilize training funds as discretionary funds will be reduced, thereby contributing to timely procurement of training resources. Another significant by-product resulting from enhanced confluence of hardware and trained personnel, will be a reduction in the requirement for costly interim contractor support.

In summary, the near-term benefits of these recommendations will be enhanced personnel management, more supportable career fields, improved career and individual stability, reduced attrition and reduced training/retraining requirements. The net result will be a better managed and more stable force.

2. Long-Term Benefits

There are a number of significant long-term benefits which the Air Force will

accrue by implementing these recommendations. For purposes of this report, long-term benefits are those that will occur beyond the first POM period following completion of implementation. The primary long-term benefits of implementation are:

- Enhanced MPT participation in the acquisition process;
- Improved weapon system supportability;
- Reduced requirements for interim contractor support.

The overall benefit of implementing these recommendations will be enhanced MPT participation in the acquisition process. MPT planners will be provided with necessary data, sufficiently early in the acquisition process, to allow meaningful participation in development of operational scenarios and maintenance concepts, as well as participation in design tradeoff decisions. MPT planners will have sufficient lead time to allow long-term force structure planning which will result in improved force utilization, stability and affordability.

The primary specific long-term benefit will be improved weapon system supportability. MPT planners will be able to influence early acquisition decisions and thus enhance the overall supportability and affordability of new systems. Planners will be able to compare MPT requirements for a new system with the total projected resource demand for both existing systems and all other systems under procurement. This will allow for early reallocation of projected resources to high priority programs and for the development of courses of action that address projected shortfalls. Planners will have sufficient information to develop required modifications to career fields or to specific Air Force Specialty Codes (AFSCs) needed to support projected new skills demand created by innovative technology.

A direct cost saving benefit will be the reduced requirement for interim contractor support. Training and training equipment requirements will be identified sufficiently early to allow for concurrent development of trained personnel and equipment. Total personnel demand will be identified sufficiently early to allow for timely personnel assignments to training programs and operational units. The ability to aggregate MPT demand will preclude the development of requirements (or authorizations) that are beyond the ability of the personnel system to support. This will enhance the ability of the Air Force to ensure that the proper numbers and types of people are available to operate, maintain and support equipment at IOC, thus reducing their requirement for interim contractor support.

E. Summary

MPT supportability of weapon systems acquisitions is the result of careful planning and management of scarce resources. The recommendations proposed are designed to enhance this planning and management. Implementation of these recommendations will create immediate benefits with additional benefits being accrued over the long-term.

While maximum benefit will be derived from implementation of the nine recommendations, partial or incremental implementation will produce significant enhancements in MPT planning and management during the acquisition process. Implementation of each recommendation provides the Air Force with continuing benefits far in excess of their implementation costs.

CHAPTER X

IMPLEMENTATION TASK STATEMENTS

A. Introduction

This chapter presents detailed task statements for implementing each of the nine recommendations presented in Chapter VIII. Each of these task statements consists of four parts:

- Introduction: a brief description of the task to be accomplished;
- Concept for Implementation: a discussion of the methods to utilize in implementing the task;
- Personnel Support Requirements: an identification of the sustaining personnel requirements created by implementation of the task;
- Level of Effort for Implementation: an identification of the contractor/Air Force and Air Force effort required for accomplishing implementation.*

B. Task Statements

Each of the nine task statements is presented individually in this chapter.

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*The level of effort estimates are divided between "contractor/Air Force personnel effort" and "Air Force personnel effort." The former represents a level of effort that can be performed by either contractor or Air Force personnel. The latter represents a level of effort that can only be performed by Air Force personnel. Manmonth estimates for Air Force level of effort are based on standard Air Force workweeks and manhour availability charts as designated in AFR 26-1 (Vol. III). The standard used in this report is 145.2 hours per month available to primary duty, based on a normal workweek for CONUS assigned military personnel. A manyear of effort is based on 12 standard manmonths. Manhour availability for contractor personnel is slightly higher than for Air Force personnel; however, for purposes of comparison, the standard 145.2 hours per month will be used in both instances. A manmonth of effort refers to the quantity of work that must be accomplished, not the number of people required to perform it. For example, a 12-manmonth effort does not of necessity require one person full-time for a year; it may be accomplished by six people working full-time for two months, or by one person working half-time over 24 months.

TASK 1

Consolidate and Enhance Regulations and Develop Procedures to Enhance MPT Reporting Requirements

A. Introduction

The objective of this task is the preparation and issuance of a consolidated Air Force Regulation (AFR) and revision of existing AFRs relative to acquisition MPT matters. This AFR would specifically state all of the requirements and responsibilities of all agencies and organizations involved in acquisition-related MPT activities. This regulation would consolidate and enhance the policy guidance that already exists in numerous Air Force regulations. Existing regulations would be revised to reflect the enhanced policies and procedures and to incorporate revised reporting requirements.

B. Concept for Implementation

A preliminary research effort would be conducted to determine what enhancements are necessary and which regulations need to be modified. This effort would involve reviewing all existing regulations and interviewing the concerned MPT sections in the Air Staff. The interviews would help to identify all acquisition-related information needs and ways in which those needs might be better met.

Examples of enhancements to MPT regulations that have been identified thus far in this study are:

- Designate an organization(s) as having overall responsibility for acquisition-related MPT activities and for assessment of the Air Force-wide impact of the total acquisition program;
- Establish requirements for field activities to report MPT data to the Air Staff at specific points in the acquisition process. All responsibilities assigned should be related to milestone decision points;
- Revise all applicable AFRs to designate specific staff agencies as having HQ USAF responsibility. All responsibilities assigned should be related to milestone decision points;
- Modify AFR 173-11 to include MPT participation in the ICA. Require a separate detailed line item breakdown of MPT requirements and include an assessment of the reasonableness of the MPT estimates themselves;
- Revise AFR 800-2 to assign a single organization the responsibility for managing the acquisition MPT program and to include procedures for managing the Milestone III production design for DoD major systems;
- Revise HOI 800-2 to include MPT reporting procedures in the Program Management Directive (PMD), and to desig-

nate either AF/MPM or AF/RDXM as having primary responsibility for ensuring that the PMD has sufficient manpower guidance and constraint data to accomplish detailed manpower planning and analysis;

- Revise AFR 25-5 to include the conduct of comparability analysis for developing new system requirements;
- Revise AFR 26-1 to include specific responsibilities and tasks related to determination of manpower requirements for acquisition programs;
- Revise AFR 26-6 to reflect the current structure of the Directorate of Manpower and Organization;
- Revise AFR 57-1 to include specification of requirements for the JMSNS;
- Revise AFR 173-11 and HOI 173-3 to ensure consistency in CAIG membership;
- Consolidate AFR 800-8 and AFR 800-15 because of similarity of content and intent.

One overall area of enhancement is development of specific MPT reporting procedures to replace inadequate ones and to incorporate the enhanced procedures into the new and revised regulations. Reporting procedures would emphasize separating out MPT requirements and MPT costs from all-encompassing categories to foster visibility and scrutiny during reviews. To avoid placing unnecessary reporting burdens on acquisition programs that do not engender substantial manpower requirements, provisions included in the regulations would direct program managers to consult their respective PMDs to see which MPT reporting requirements are applicable to their particular programs. Specific MPT analytical methods would be included among the prescribed MPT procedures.

In the first draft of the consolidated AFR, responsibilities and requirements would be written in a very detailed manner. This would offset some of the generalization that usually happens to regulations as they move through the review process.

Some of the items that, at a minimum, would be included in the consolidated AFR are:

- General policies and information;
- Responsibilities of participating agencies;
- Definition of terms;
- Reporting requirements;
- Reporting timelines;
- Analytical requirements;

- MPT requirements in terms of DSARC/AFSARC milestone periods;
- Report formats;
- Reviews and approvals;
- References to related regulations.

After the first drafts of the consolidated regulation and the modified regulations are written, they would be reviewed, staffed and coordinated through the normal channels.

C. Personnel Support Requirements

After implementation of the new regulations and reporting procedures, one individual in the newly established policy focal point (see Task 2) would be required to spend a portion of his/her time coordinating and distributing the new regulations and procedures as well as ensuring that regulations continue to reflect current policy and procedures. Additionally, one person should be tasked with monitoring the application of enhanced reporting procedures to ensure that requirements for format, content and timeliness are met.

D. Level of Effort for Implementation

We estimate that the level of effort needed to complete this task would be equivalent to 24 manmonths of effort over an 18-month period. Approximately 18 manmonths of Contractor/Air Force personnel effort should be directed at researching and consolidating the regulations and drafting enhancements. Approximately six manmonths of Air Force personnel effort will be required to review, staff, and coordinate the consolidated and enhanced regulations and to manage this effort.

TASK 2

Define Requirements for and Establish Organizational Focal Points for Acquisition-Related MPT Matters

A. Introduction

The objective of this effort is to identify both the organizational and functional requirements necessary for the establishment and operation of focal points for acquisition-related MPT matters. Appendix K identifies 28 functional requirements based on our preliminary study. Two separate but related foci should be created. One focus would be located at the Air Staff level and would concentrate on acquisition MPT policy matters. The other focus would be located within Air Force Systems Command and would concentrate on operational matters. Proposed organization relationships for the two acquisition MPT foci are shown in Exhibit X-1. Each focal point is discussed below.

B. Concept for Implementation

1. The Policy Focal Point

The policy focus would be located within Air Force Directorate of Personnel Plans (AF/MPX) in order to support AF/MPX's role in long-range force development and planning. It would be either a part of or parallel to the Long-Range Personnel Planning Branch (AF/MPXXX). This group would be organized in a matrix fashion and would include members experienced in manpower, personnel, and training; specific experience in the acquisition environment would be highly desirable. Close coordination would be maintained with the Directorate of Manpower and Organization (AF/MPM), the Directorate of Personnel Programs (AF/MPP), the Directorate of Operational Requirements (AF/RDQ), the Directorate for Maintenance and Supply (AF/LEYE), and the Directorate of Operations (AF/XOO), among others, to ensure that specific subject matter expertise would be available to deal effectively with acquisition-related MPT issues.

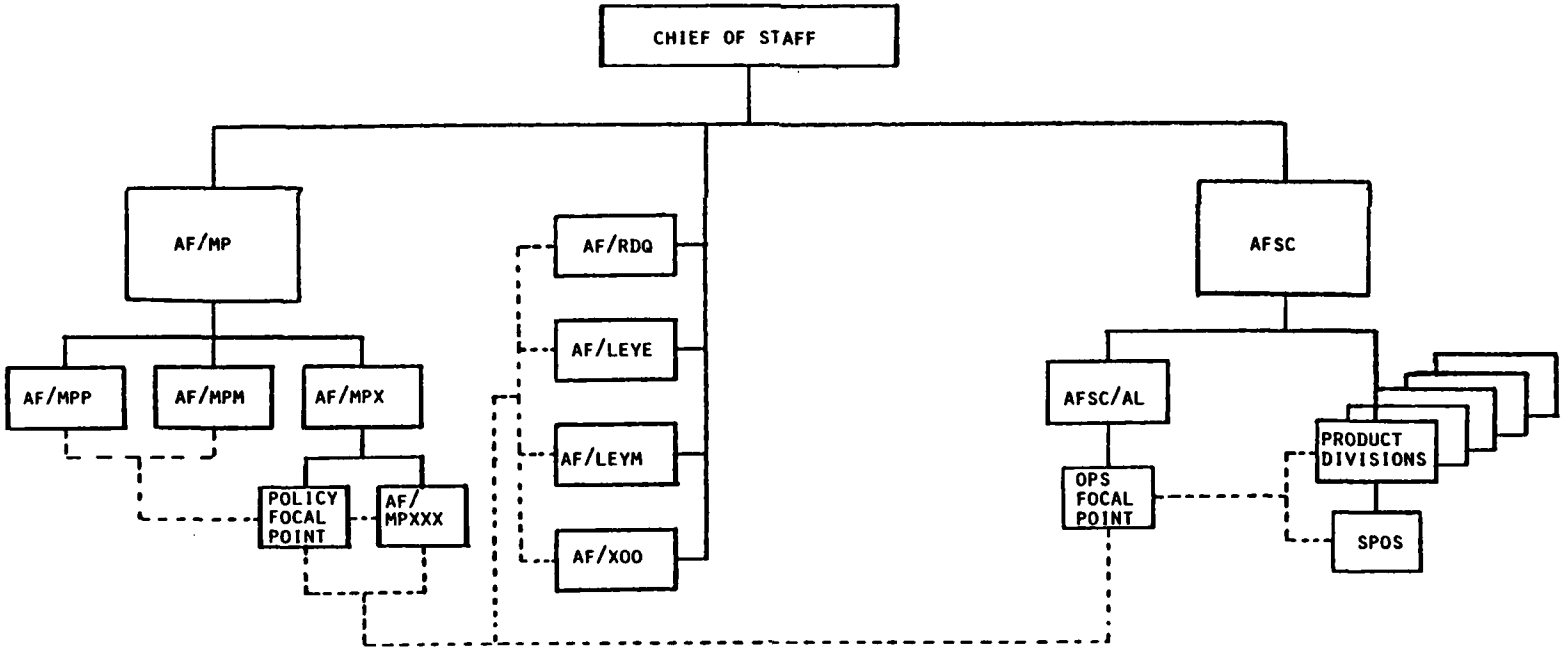
This group would have primary responsibility for the development, maintenance, and promulgation of acquisition-related MPT policies. It would act as the Office of Primary Responsibility (OPR) for the MPT portions of applicable acquisition AFRs. Additionally, it would act as the primary MPT resource for other Air Staff sections involved in the acquisition of new systems. It would coordinate with the MAJCOMs, the Manpower and Personnel Center (AFMPC), the Air Training Command (ATC), the Air Force Test and Evaluation Center (AFTEC) and other interested parties on acquisition MPT policy matters.

This group would provide support to all Air Staff activities requiring acquisition MPT participation, including the Air Force Systems Acquisition Review Council (AFSARC), Defense Systems Acquisition Review Council (DSARC), Requirements Review Group (RRG), and Requirements Assessment Group (RAG). It would monitor the status of acquisition programs with MPT implications and would provide Air Staff coordination on the MPT portion of acquisition documents and reports. It would also coordinate development and planning of MPT requirements among the using command, the supporting command, and the developing command. Additionally, this group would provide any necessary MPT participation in the development of the operational scenarios and maintenance concepts for new systems.

Exhibit X-1

PROPOSED ORGANIZATIONAL RELATIONSHIPS

OF ACQUISITION MPT FOCUS



TASK 5

Define Requirements and Develop Techniques to Enhance MPT Participation in the Development of Operational Scenarios and Maintenance Concepts

A. Introduction

The objective of this task is to enhance MPT participation in the development of operational scenarios and maintenance concepts. This is the portion of the acquisition process in which the most significant MPT tradeoffs are possible and during which MPT participation is the least.

B. Concept for Implementation

The first requirement of this task is an examination of the roles of all of the various participating, implementing, using, and operating commands regarding maintenance concept and operational scenario development. This examination would focus on how to best increase the participation of the MPT focal points (as described in Task 2) in these processes. After the techniques are developed and the regulations defined, Air Force regulations would be amended to include this greater participation.

Among the regulations that may require revision are the following:

- AFR 25-8 Logistics Composite Model;
- AFR 57-1 Statement of Operational Need;
- AFR 66-14 Equipment Maintenance Policies, Objectives, and Responsibilities;
- AFR 80-14 Research and Development - Test and Evaluation.

Currently, HQ USAF level MPT participation in operational scenario development is limited to post-Milestone III activities when the Directorate of Manpower and Organization (AF/MPM) assumes OPR for the operational scenario. There is generally no direct MPT participation in the development of the maintenance concept. Rather, Air Force Specialty Codes (AFSCs), skill levels, and tasks are determined by the using command's logistics maintenance manpower branch, in conjunction with AF/LEY.

A concomitant effort would be directed at creating an analytical capability that would allow MPT analyses to become part of the design process rather than a reaction to it. This would result in MPT input into determining constraints on the magnitude of manpower requirements engendered by new systems. Existing models would be revised and new models developed to estimate measures of merit that permit the systems designers to gauge the relative impacts of various alternatives. Resident or on-call MPT analysts, as described in Task 4, would assist the systems designers in this endeavor.

Since design data are characteristically minimal and inexact in the early stages of the WSAP, these analytical capabilities would be required to accept rough data, educated guesses, or simple parameters as adequate input. Importantly, rough data inputs would allow systems designers to compare the relative requirements of different design alter-

natives. Data inputs would have to be readily available and would probably be provided by the cadre of MPT analysts as described in Task 4. These analytical capabilities would be designed for easy performance and would not require the use of any off-site or cumbersome equipment. A microcomputer or hand-held calculator would be ideal for this function. The output from these analytical methodologies would be required to have quick turnaround time and would be simple to interpret. The MPT Technical Handbook, as described in Task 3, would include easy-to-understand step-by-step instructions on how to perform these analyses. These analytical methodologies would include estimates of non-system specific manpower groups (e.g., cooks, clerks, and medics) that are historically overlooked in early MPT estimates and that contribute significantly to manpower requirements under certain operational scenarios. Finally, these analytical methodologies would have the facility for revising and re-estimating MPT requirements interactively with the development of the system.

After these analytical methodologies are developed, they would be tested, validated and field tested prior to their full implementation. In addition, the results of this effort would be incorporated into the MPT Technical Handbook that would be developed concurrently with this effort. (See Task 3.)

C. Personnel Support Requirements

Once established, ongoing manpower requirements for increased participation in development of operational scenarios and maintenance requirements would be necessary. Periodically, as basic assumptions of the analyses or as major variables change, it may be necessary to re-examine and modify the algorithms developed for these analytical methodologies. However, we are not projecting an increased level of effort resulting from this task because these activities are incorporated into the requirements of the MPT Policy Focal Point as described in Task 2.

D. Level of Effort for Implementation

We estimate that the level of effort required to complete this task is approximately 8 manmonths over a 9-month period. Contractor/Air Force personnel effort of 6-manmonths would be necessary for development of techniques and definitions of requirements. Air Force personnel effort of approximately 2 months would be required to manage this effort and to staff, coordinate, and establish regulations governing enhanced MPT participation in the development of operational scenarios and maintenance concepts. The results of this effort should be coordinated with developing requirements for the MPT focal points (Task 2) and should be included in the MPT handbooks (Task 3).

TASK 4

Provide the SPO with an MPT Analytical Capability

A. Introduction

The purpose of this task is to create the organizational structure necessary to provide the SPO with an MPT analytical capability. This MPT analytical capability would be provided in one of two ways — resident or on-call cadres of MPT analysts — and, as such, would be responsive to the requirements of each SPO.

B. Concept for Implementation

A resident capability would be provided to those SPOs, such as DoD major programs and large basket SPOs, that have a large number of MPT analytical activities. Resident capability would consist of one person in AFSC 73371 (Manpower Management Technician). This individual would perform two primary functions. First, this person would monitor and manage all MPT functions, ensure that reports are prepared and submitted, distribute data as required, and coordinate the timely support of outside agencies such as ATC and AFTEC. Second, this person would assist design and engineering personnel in conducting MPT analyses through the application of management engineering techniques and MPT analytical methodologies. This would include coordinating the utilization of Logistics Composite Modeling (LCOM) through the development of task networks and scenario application, as well as assessing the applicability of the various MPT technologies and coordinating their use. Though these individuals would be located in the SPO, their ultimate responsibility would be to the product division or to the MPT operational focal point to ensure that analysis is not colored by external considerations.

MPT analytical services that are beyond the expertise of the resident analysts would be provided by an on-call capability located within product divisions. This organization would provide consulting services to resident analysts and would also provide a complete range of MPT analytical services to those SPOs without sufficient volume of MPT business to justify a resident analyst. The on-call organization would provide a broader range of skills than would be available through the resident analyst and would probably include representatives from the following occupations: 34XXX (Training Devices), 73391 (Manpower Management Superintendent), 73371 (Manpower Management Technician), 75199 (Education and Training Superintendent), 75172 (Training Technician), and 75173 (Instructional Systems Technician).

Primary emphasis for on-call analysts would be on developing pre-Milestone II estimates, with particular attention given to the pre-Milestone I period. Accordingly, additional training would probably be required in techniques of developing the more subjective early estimates, establishing baseline systems, conducting comparability analysis, and coordinating the full range of acquisition-related MPT activities. A new AFSC shredout for the 733XX field may be required to designate an acquisition MPT technician.

C. Personnel Support Requirements

It is estimated that establishment of initial resident capability to SPOs would require 12-15 enlisted spaces Air Force-wide. Within each of the five product divisions, the on-call cadres would probably require an officer-in-charge (grade O3 or O4) and

seven to ten analysts in the above-mentioned occupations. A product division, such as armament, with less variation in MPT requirements among its systems may require fewer analysts. A survey of each product division would be required to determine the proper manpower requirements of the on-call analytical staff.

D. Level of Effort for Implementation

We estimate that the level of effort needed to complete this task is approximately 4 manmonths over a 6-month period. This effort could be conducted concurrent with and coordinated by the same OPR in charge of tasks 1, 2, and 3. Its results should be reflected in the consolidated regulations, the requirements for an operational focal point, and the MPT handbooks. Contractor/Air Force personnel effort of 2 manmonths would be necessary for concept development. Two manmonths of Air Force personnel effort would be directed at activities necessary to establish this organizational structure and to develop requisite AFSC shredouts.

Exhibit X-2
(Continued)

Section Three: Aids to Fulfilling MPT Requirements

Milestone 0, Activity 1

- Support agencies and points-of-contact
- Analytical tools
- Technical and other manuals
- Other source materials

Milestone 0, Activity 2

- •
- •
- •

Section Four: Guide to MPT Analytical Tools

- Introduction
- The scope and uses of MPT technology
- Summary table of technical tools and their applications

Analytical Tool 1

- Purpose and applications
- Options available
- Qualifications of users
- Analytical support services available
- Time estimate for use of tool
- Cost estimate for use of tool
- Data input requirements
- Data input services available
- Interfaces with other models
- Specific outputs
- Possible modifications of tool
- Points-of contact
- Manuals or materials available

Analytical Tool 2

- •
- •
- •

The handbook's second section would be a compendium of all of the PM's and DPML's MPT responsibilities organized chronologically by milestone and phase. A quick-reference summary chart would allow the PM and DPML to view all of these responsibilities and requirements at a glance. The PM and DPML would be provided with dates, required MPT activity descriptions, major tasks per activity, specific reporting procedures, specific deliverables (e.g. reports, estimates) and their due dates, specific requirements for approvals and reviews, organizational relationships, and references to applicable activity aids presented in Section 3 of the handbook. In order to illustrate reporting procedures, samples of properly completed MPT-related reports would be presented, along with a summary check list of all documentation responsibilities. Prescribed or suggested methodological procedures would be referenced and readers would be directed to the appropriate technical handbooks and manuals.

The third section of the MPT Acquisition Manager's Handbook would be organized chronologically by MPT activities. This section would serve as a guide to locating the different sources of assistance available within the Air Force that PMs and DPMLs can use in fulfilling their MPT responsibilities. These sources of assistance include support agencies, points of contact, sources of analytical tools and data bases, technical and other reference manuals, and source materials.

The fourth section would be a desk guide to the array of technical tools developed by the Air Force (usually AFHRL), for use in acquisition-related MPT analytical tasks. It would contain concise, pertinent information about each tool available for current use and its application so that the Program Manager could decide which tool(s) to pursue for a particular purpose. Also, this section of the handbook would provide point-of-contact information directing the PM to the proper sources for further information and/or assistance.

2. MPT Technical Handbook

This handbook would be designed to give current or anticipated SPO MPT analysts the step-by-step instructions they would need to carry out their specific MPT responsibilities. Prior to preparation, a study would be conducted to determine which MPT analytical methods can be performed primarily by SPO support MPT analysts, the intended audience of the handbook. (Task 4 describes the proposed cadre of SPO support MPT analysts.) However, this handbook would also be appropriate for use by the prime equipment contractor's MPT staff. Its primary advantage would be its provision of consistent and uniform techniques that produce readily comparable results.

The handbook would describe all techniques and algorithms necessary to conduct MPT analysis at the SPO level. It would describe and provide instructions for such activities as task network development and comparability analysis. Where sufficient algorithms and/or techniques do not exist, they would be developed for inclusion in this handbook. All instructions in the handbook would be tailored to the anticipated level of expertise that would be available in or to the SPO.

For those tasks that could be performed primarily by SPO support MPT analysts but that could require assistance from more sophisticated analysts, the handbook would direct the MPT analysts to the appropriate sources of aid (e.g., Air Force Management Engineering Agency [AFMEA], Air Force Human Resources Laboratory [AFHRL], or product divisions). For MPT analyses beyond the abilities of current or anticipated SPO support MPT analysts, the PM will be able to contact appropriate technical assistance outside of the SPO by referring to the MPT Acquisition Manager's Handbook. Exhibit X-3 provides a sample outline of the MPT Technical Handbook.

Exhibit X-3

SAMPLE OUTLINE FOR THE MPT TECHNICAL HANDBOOK

Cover

Table of Contents

Introduction
- Use of Handbook
- Summary of Contents
- Organization of Handbook
- Summary Table

Analytical Task 1

- Introduction
  - Purpose of analytical task
  - Inputs and outputs
  - Material/equipment needed
  - Technical skills needed
  - When to perform
  - Estimated time needed
  - Points-of-contact

- Step-by-Step Instructions

Analytical Task 2

- •
- •
- •

C. Personnel Support Requirements

After implementation of the MPT handbooks, one individual in the Operational Focal Point (see Task 2) would be required to distribute handbooks, monitor suggestions and recommendations for enhancements and manage annual revisions. This would require an estimated 2 manmonths of Air Force effort per year.

D. Level of Effort for Implementation

The MPT Acquisition Manager's Handbook would require an estimated level of effort of 15-18 manmonths of contractor/Air Force personnel effort over an 18-month period. This would include researching and drafting the handbook, reviewing comments and suggestions, making necessary revisions, preparing and giving supporting briefings, and providing such other technical support as necessary.

The MPT Technical Handbook would require an estimated level of effort of 45-48 manmonths of contractor/Air Force personnel effort over a 36-month period. This would include researching and drafting the handbook, reviewing comments and suggestions, making necessary revisions, and preparing and giving supporting briefings. A major and very important part of this effort would include the development of the tools and techniques necessary to conduct MPT analysis in the Milestone I and II time frames. Such other technical support as may be requested would also be provided.

Approximately 6 manmonths of Air Force effort would be necessary to manage, review, staff, and coordinate this effort.

TASK 3

Prepare MPT Acquisition Manager's Handbook and MPT Technical Handbook

A. Introduction

The objective of this task is the preparation of two MPT handbooks. The collective purpose of these handbooks would be to provide acquisition managers, MPT technical staff, and concerned agencies with a complete and readily available source of information and instructions to fulfill their MPT responsibilities.

Each handbook is intended to be used as a day-to-day guide and working document. Each handbook would be written clearly, concisely, and with a particular audience in mind. Each would be designed for quick referencing and for efficient and facile updating of its components.

The two handbooks are:

- MPT Acquisition Manager's Handbook;
- MPT Technical Handbook.

B. Concept for Implementation

1. MPT Acquisition Manager's Handbook

This handbook would serve as the primary reference guide to MPT policies, responsibilities, and requirements for SPO Program Managers (PMs), and Deputy Program Managers for Logistics (DPML). It would also be suitable for use by such agencies as AF/MP, AFMPC, AFTEC, and ATC to determine type, format, content, and availability of acquisition-related MPT data. It would be composed of four sections:

- Section 1: Regulations;
- Section 2: MPT Responsibilities and Requirements;
- Section 3: Aids to Fulfilling MPT Responsibilities;
- Section 4: Guide to MPT Analytical Tools.

A proposed outline for the MPT Acquisition Manager's Handbook is shown in Exhibit X-2.

The first section would contain all MPT pertinent regulations (including DoD Directives, DoD Instructions, Military Standards, Air Force Regulations, and Headquarters Operating Instructions) or excerpts of regulations where applicable. It would consolidate all current acquisition-related MPT policy guidance. For information on all the pertinent regulations for a single MPT issue, the Program Manager or DPML would be able to consult a Subject Index. Optional commentaries following some individual regulations would help clarify and summarize the MPT responsibilities and requirements contained within particularly complex or piecemeal regulations.

Exhibit X-2

SAMPLE OUTLINE FOR THE
MPT ACQUISITION MANAGER'S HANDBOOK

Cover

Table of Contents

Introduction

- Use of Handbook
- Summary of Contents
- Organization of Handbook

Section One: Regulations Governing MPT Policy in the Acquisition Process

- Subject Index
- Regulations
- Optional Commentaries

Section Two: MPT Responsibilities and Requirements

- MPT Acquisition Focal Point(s)
- Quick Reference Summary Table
- Summary Check List of Documentation Responsibilities

Milestone 0, Activity 1

- Discussion of related MPT policies, responsibilities and requirements
- Report Procedures and samples of completed formats

Milestone 0, or Activity 2

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- •
- •

This group would maintain close and continuous contact with the operational focal point for the collection, processing, and distribution of acquisition MPT data. It would coordinate MPT supportability assessments and would distribute projected personnel skill inventories and other MPT constraint information to the acquisition community.

2. The Operational Focal Point

The operational focal point would be located within the Air Force Systems Command (AFSC), probably within the Office of the Deputy Chief of Staff for Acquisition Logistics (AFSC/AL). This location would be consistent with AFSC's mission to develop and acquire new systems. The role of MPT factors as Integrated Logistics Support (ILS) elements and as part of the Logistics Support Analysis (LSA) process (as defined in MIL-STD-1388-1A) indicates that AFSC/AL would be a logical place for this function.

This organization would act as a point-of-contact and as a source of assistance to acquisition MPT personnel in the SPOs, product divisions, MAJCOMs, and other involved agencies. It would act as an information resource center for MPT technology and would coordinate enhancement of existing technology and the development of new technology.

The operational focal point would monitor and manage acquisition MPT reporting. It would support development of the MPT portions of acquisition documentation (e.g., Program Management Directive [PMD], Justification for Major System New Starts [JMSNS], Decision Coordinating Paper [DCP], etc.) and would review draft and final versions of those documents.

The operational focal point would provide information support for AF/MP participation in AFSARCs, DSARCs, RRGs, RAGs, and other acquisition activities. It would participate in preliminary design reviews and in critical design reviews and would also support MPT participation in Systems Command Acquisition Review (SCAR) and SPO review.

This organization would manage and operate the aggregation and assessment system (see Task 9). It would develop Air Force-wide, acquisition-driven MPT requirements and would assist AF/MP in integrating them with the requirements for existing systems in order to determine the net impact of new systems.

C. Personnel Support Requirements

Staffing of the policy focal point would require five to seven officers in the grades of O3, O4, and O5. These officers should be experienced in manpower, personnel, and/or training planning and management. Acquisition related experience would be desirable. This organization would also require the support of at least one dedicated clerical person, either Air Force or civilian.

Staffing of the operational focal point would require 15-18 people. This would include five to eight officers in the grades of O3, O4, and O5 who are experienced in manpower, personnel, and/or training planning and management. It would also include seven to twelve enlisted personnel in occupational fields 341XX (training devices), 511XX (computer systems), 733XX (manpower management), and 751XX (education and train-

ing). All personnel will require some degree of training in acquisition management, and an acquisition MPT support shredout may be required to facilitate personnel management. Additionally, the support of one or two dedicated clerical personnel, either Air Force or civilian, would be required.

D. Level of Effort for Implementation

We estimate that the level of effort needed to complete this task is 9 manmonths of effort over a 12-month period. Contractor/Air Force personnel effort of 5 manmonths should be directed at conducting the necessary study of requirements. Air Force personnel effort of 4 manmonths should be directed at the actual tasks necessary to establish the two focal points. The results of this effort will have to be incorporated into the consolidated regulations discussed in Task 1 and into the handbooks discussed in Task 3.

TASK 6

Determine the Proper Role of AF/MP in Current Contractor Incentive Initiatives

A. Introduction

The objective of this task is for the Air Force MPT community to participate in the source selection initiatives underway in the Air Force and DoD. These initiatives, spawned by the Carlucci Memorandum of 30 April 1981, are aimed at developing new policies and new contractor incentives and requirements for source selection. Participation in these initiatives would increase the status of manpower requirements criteria in the source selection process of WSAPs. Additionally, contractor MPT estimates would also be forced to reflect more accurately the MPT requirements needed to support the proposed system.

B. Concept for Implementation

Participation in these initiatives would be undertaken initially by AF/MP and then, when established, by the Air Staff MPT policy focal point, as described in Task 2. Prior to participation, it is necessary to investigate fully the current initiatives and their status. Following is a summary of three initiatives underway in late 1982.

1. DoD Acquisition Improvement Steering Group

At the DoD level, a DoD Acquisition Improvement Steering Group was tasked with improving contractor incentives in the supportability area and in other readiness acquisition areas. This group was overseen by the Office of the Under Secretary of Defense for Research and Engineering (USDRE), and it included members from the services, among them the Deputy Assistant Secretary of the Air Force (Acquisition Management) (SAF/ALP). Perhaps its greatest achievement to date (Winter 1982) was the consolidation of support items budgeted for a particular acquisition program in the FY83 and FY84 POM. The Air Force was trying out these trial funding procedures on the GLCM, NGT, and EDS systems. Representatives from the Air Force in this effort were the Assistant Secretaries of the Air Force for financial management (SAF/FM) and for Research Development and Logistics (SAF/AL) and (RD&L). In addition, a working group chaired by USDRE/Acquisition Management was planning to revise DoDD 4105.62, the source-selection directive. In the past, USDRE has been receptive to manpower concerns (26 August 1981 memorandum).

2. Manpower Reserve Affairs and Logistics (MRA&L)

Also at the DoD level, MRA&L was working with the services or alone to improve manpower and logistics support capabilities. A joint effort was underway to establish front-end Logistic Support Analysis (LSA) guidelines so as to be able to identify candidate acquisition programs that should be given contractor incentives. MRA&L was studying approaches to identify skilled manpower and training requirements. In addition, the material commands from each service were organizing a senior-level group from the

procurement, readiness support, and reliability areas to select implementation approaches (award fees, incentives, or source-selection criteria) for each weapon system.

3. Air Force Product Performance Guide

At the Air Force level, a Product Performance Agreement Guide was published jointly by AFLC and AFSC that summarized different incentive contracting techniques. Unfortunately, MPT requirements were not singled out as a product performance item, but were subsumed under logistics support. A clearinghouse — the Product Performance Agreement Center (PPAC) — was being established at Wright-Patterson AFB to provide information, analyses, and technical assistance on performance agreement incentives to program offices.

C. Personnel Support Requirements

We are not projecting an increased personnel requirement resulting from this task because these activities are incorporated into the requirements of the MPT Policy Focal Point described in Task 2.

D. Level of Effort for Implementation

We are not including an estimated level of effort for this task. Participation in the existing contractor incentives program will be ongoing within AF/MP and will have a limited implementation requirement. In terms of accomplishing this task as part of the total implementation of these recommendations, it should not have substantial direct cost.

TASK 7

Enhance the Visibility of MPT Requirements in the POM Process

A. Introduction

The objective of this task is to increase the visibility of MPT requirements associated with systems acquisition during the POM process. MPT requirements associated with a single system are contained in several Program Decision Packages (PDPs), making consolidated planning and management difficult.

B. Concept for Implementation

There are two activities associated with this task. The first activity is to have AF/MP and, when established, the policy focal point (as described in Task 2) coordinate with and support an effort of the Deputy Chief of Staff, Logistics and Engineering (AF/LE) aimed at including the Program Decision Packages (PDPs) of each command involved in an acquisition program as an information addendum to the PDP of each of the others. As a result of this effort, the implementing, using and supporting commands would be aware of the corresponding MPT requirements of the other commands. Through this increased knowledge, gaps and duplications in MPT requirements documented in the PDP for a particular acquisition program would be recognized and then subjected to correction.

The second activity of this task is to develop a specific budget tag for training requirements associated with a particular acquisition program. This budget tag would consolidate all the various, separate budget requests now associated with training for a particular acquisition program. In order to develop this budget tag the budget process involving training requests would have to be studied for an optimal approach; involved agencies would have to be consulted; and affected Air Force regulations would have to be amended to include this change. This effort would be closely coordinated with ongoing efforts in the Directorate of Personnel Programs (AF/MPP).

C. Personnel Support Requirements

We are projecting no sustaining requirement associated with this task. The activities involved would become a part of the POM and PDP processes and would be accomplished by personnel normally associated with that function.

D. Level of Effort for Implementation

We estimate the level of effort needed to complete this task to be 4 manmonths over a 6-month period. Contractor/Air Force personnel effort of 1 1/2 months would be needed to complete the requisite research and develop the proper approach. Air Force personnel effort of 2 1/2 months would be needed to staff and coordinate the PDP effort and the budget tag effort. The results of this effort should be integrated into the consolidated regulations and handbooks discussed earlier.

TASK 8

Enhance Transfer of MPT Technology from the Laboratory to the Field

A. Introduction

The purpose of this task is to establish an OPR for MPT Technology Transfer. The purpose of this OPR will be to facilitate the transfer of MPT technology from the laboratory to the field and to assist with and coordinate the development of new MPT analytical models and methodologies that will provide a continued and useful capability to Air Force MPT analysts.

The Air Force is a leader among the services in possessing the technologies and analytical tools to determine early manpower requirements for systems acquisitions. Despite this, difficulties exist in transferring the appropriate technology from the laboratory to the intended user in the field. Existing user organizations, at both the Air Staff and SPO levels, do not have a specific organizational framework for transferring technology from the lab to the SPO. This causes suboptimal utilization of these tools. Often the user organizations are not even aware that these tools exist, or when they are aware they may apply them improperly. As a result, the effectiveness of MPT participation in the early phases of the acquisition process becomes limited, thereby reducing the impact of MPT on design and development decisions. Untimely or poor MPT estimates caused by inadequate use of technology also lead to delayed or inaccurate MPT estimates in the POM; thus, they handicap long-range planning.

The technologies that have been developed, furthermore, may not always be suitable to the immediate or practical needs of program managers and the Air Staff, because the link between the lab and the field has been weak. If program managers are to be encouraged or directed to use more technological tools, they should also be given the opportunity to shape applications of those tools. Therefore, an OPR for technology transfer is needed to serve as a link between the laboratory and the field. This OPR will facilitate the utilization of MPT technology in SPOs and will ensure that technologies being developed are receptive to the needs of program managers and MPT planners.

B. Concept for Implementation

The first activity in this task is to determine the functional requirements of an OPR for technology transfer. Factors to be considered include: mission; organizational structure; staffing; resource requirements; reporting requirements; lines of communication to SPOs and product divisions; interactions with MPT cadres of analysts, the operational focal point, and the policy focal point; and role in development of new MPT technology.

The second activity in this task is to identify a suitable location for an OPR for MPT Technology Transfer. We believe that the logical location for the OPR is within the Air Force Human Resources Laboratory (AFHRL) at Wright-Patterson AFB. AFHRL, which has an expressed interest in seeing that there is enhanced transfer of MPT technology from the laboratory to the field, is presently responsible for developing and operating various technologies available for MPT analysis during the acquisition process.

Based upon the functional requirements developed during this task a dialogue should be established with AFHRL concerning its perception of these functional requirements and its attitude toward locating an OPR for MPT Technology Transfer at AFHRL. If the results of this activity are positive, actual establishment of the OPR should be undertaken.

C. Personnel Support Requirements

Personnel support requirements that are created by accomplishment of this task will be provided by AFHRL and by the MPT policy and operational focal points discussed earlier (Task 2). MPT technology transfer personnel support requirements of the focal point(s) have been included in the focal point(s) personnel support requirements. The AFHRL personnel support requirements cannot be estimated until functional requirements for the OPR for MPT Technology Transfer are defined.

D. Level of Effort for Implementation

The duration of this implementation effort will be approximately 5 months, and it will require a total of 3 manmonths of contractor/Air Force and Air Force personnel effort. Contractor/Air Force personnel effort of 1 manmonth will be required to determine the functional requirements of an OPR for MPT Technology Transfer. An Air Force personnel effort of approximately 2 manmonths will be required to locate and coordinate the establishment of this OPR.

TASK 9

Develop MPT Assessment and Aggregation Capability

A. Introduction

The purpose of this task is to develop an automated capability to identify, account for, assess, and aggregate the long-term MPT requirements necessary to support the development, deployment, and operation of Air Force systems in the WSAP. This task will result in the creation of an operational MPT supportability assessment and aggregation information system that will utilize information generated by the MPT community in performing its responsibilities.

The Air Force currently has no method for aggregating and assessing the total demand for acquisition-related manpower requirements during the out-years (post-Five Year Defense Plan [FYDP]. This shortcoming is especially significant in that there is no capability for assessing the impact of these requirements on Air Force management of skills, grade structure, or end strength. Because of the inability to identify long-range macro-level requirements, there is no capability for assessing Air Force requirements against projected personnel inventory in order to develop the necessary personnel and training plans to ensure that the future force will be capable of supporting system requirements.

The Air Force currently has effective tools for projecting the short-term manpower requirements associated with individual systems in the later stages of the WSAP. There is not, however, a corresponding set of tools for aggregating and assessing the manpower impact of the entire acquisition program during the out-years. Although it is possible to assess the MPT ownership costs of individual systems, these assessments are made in isolation and it is currently not possible to assess the MPT ownership costs of the entire acquisition program. A capability is needed to identify and aggregate the long-range manpower requirements associated with both new and existing systems. Quantitative and qualitative manpower requirements should be associated with the acquisition program and identified in relation to the year in which they are required. This capability should be for fairly long projections, a minimum of 15 years, to correspond to the five years of the FYDP and the ten years of the Extended Planning Annex (EPA). Further, methodologies should be developed for comparing the total acquisition-related MPT requirements to resource projections in order to evaluate Air Force-wide MPT supportability of all existing and future systems.

B. Concept for Implementation

This task consists of six major subtasks that together, will create the desired aggregation and assessment capability. These subtasks are:

- Subtask 1: Conduct Needs Assessment;
- Subtask 2: Identify Potential Data Sources;
- Subtask 3: Develop System Design and Supporting Documentation;

- Subtask 4: Develop and Test Software and Supporting Documentation;
- Subtask 5: Conduct System Test and Implementation;
- Subtask 6: Collect and Load Data.

1. SUBTASK 1: Conduct Needs Assessment

The objective of this subtask is to conduct an assessment of potential user need for acquisition-related MPT aggregation and assessment data. This would include identification of all potential users, from engineering and design personnel through DSARC and POM decision makers. It would also include an evaluation of the types of data required by each potential user and the form in which those data would be most usable. Based upon the results of this assessment, we can begin to identify potential data sources (Subtask 2) and begin to design the aggregation and assessment system and supporting documentation.

The estimated level of effort required for this subtask is approximately 2 1/2 manmonths over 3 months. Approximately 1 1/2 manmonths of contractor/Air Force personnel effort would be required to conduct this assessment. Approximately 1 manmonth of Air Force personnel effort would be required to manage this effort and review the results.

2. SUBTASK 2: Identify Potential Data Sources

The objective of this subtask is to identify and assess potential sources of data, both automated and nonautomated, that support the aggregation and assessment capability. This assessment would include types of data available and their accessibility, as well as the requirements for reformatting or preprocessing these data. For automated systems, an additional assessment would be made of the suitability of the system's potential for establishing an automated interface.

The results of these assessments, in addition to the results of Subtask 1, will provide the basis for designing the aggregation and assessment system and developing the supporting documentation.

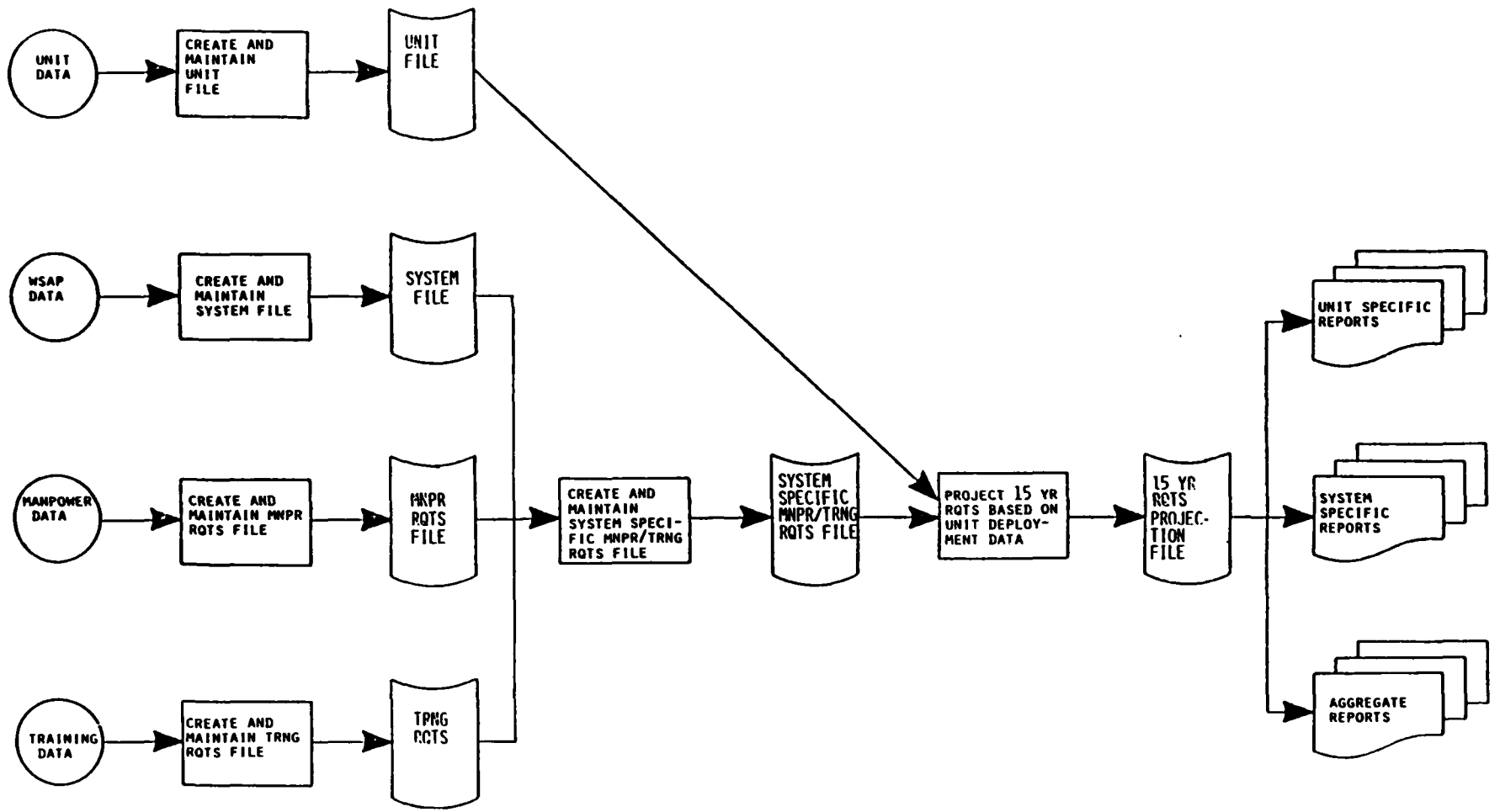
The estimated level of effort required for this subtask is approximately 3 manmonths over a period of 2 months. Contractor/Air Force personnel effort of approximately 2 manmonths would be required to conduct this assessment. Approximately 1 manmonth of Air Force personnel effort would be required to manage and review this effort.

3. SUBTASK 3: Develop System Design and Supporting Documentation

The objective of this subtask is to develop a design suitable for systems development and to produce the supporting systems documentation. This effort would include specification of data input requirements, system operating functions, data base design, security, backup procedures, audit trails, maintenance, data manipulation, user interface, and output and reporting requirements. The assessment and aggregation capability would take the general form shown in Exhibit X-4. The system documentation that would be

Exhibit X-4

AGGREGATION AND ASSESSMENT CAPABILITY



developed as part of this subtask includes the Functional Description, the Data Base Specification, the Data Requirements Document, and the Program Specification. These documents would all be prepared in accordance with Automated Data Systems Standards (DoD Standard 7935.1-5). Acceptance of these documents would establish an understanding between the user and the developer as to the system's form and function.

The results of this effort would provide all of the necessary requirements to direct the actual development of the system software and to facilitate the acquisition of necessary hardware.

The estimated level of effort required for this subtask is approximately 10 manmonths over 4 months. Contractor/Air Force personnel effort estimated for the development of the Functional Description, Data Base Specifications, Data Requirements Document, and Program Specifications would be 9 manmonths. Approximately 1 manmonth of Air Force Personnel effort would be required to manage and evaluate this effort.

4. SUBTASK 4: Develop and Test Software and Supporting Documentation

The objective of this subtask is to develop and test the software that would provide the basis for the aggregation and assessment capability. Individual program specifications would be refined, code would be written, and the programs would be tested. Programs would then be integrated into functional modules, and each module would then be tested. The functional modules would be integrated into a total system and the total system would be tested. The tests conducted during this subtask would be developmental tests and are not to be confused with the user's acceptance test to be conducted during Subtask 5. The documentation developed during this effort would include the Program Maintenance Manual, the Computer Operations Manual, the User's Manual and training documentation. This subtask would result in an operational system that would be in compliance with the Functional Description.

The estimated level of effort required for this subtask would be approximately 32 manmonths over 13 months. Contractor/Air Force personnel effort of 28 manmonths would be required to accomplish this subtask. Air Force personnel effort of 4 manmonths would be required to manage, evaluate, and review the results of this subtask.

5. SUBTASK 5: Conduct System Test, Implementation and Training

The objective of this subtask is for the user to conduct system acceptance testing. Primary responsibility for acceptance testing would be with the user; support would be provided by the developer. There are three activities included in this subtask.

The first activity of this subtask would be development of a Test Plan that would be consistent with and encompass all the requirements of the Functional Description. The test plan would be designed to ensure that all functions are tested in the same manner in which they will perform in the operational environment.

The second activity of this subtask would be the preparation of specially designed test data. The test data would be designed to test a maximum number of functions in each operating situation. The data would include intentional errors to evaluate the system's ability to recognize faulty data. The data would be designed so that the results

of the tests would be predictable if the system was operating to specification. That is, all unanticipated errors would be the result of system error and not data structure.

The third major activity would be the actual conduct of the test. All design errors would be noted and corrections made. Any user-desired modifications to system design that are beyond the scope of the Functional Description would be noted for future enhancement. When the system satisfied all user acceptance tests, it would be certified as acceptable for operational use and implementation.

The final activity would be presentation of user training. User training would be based on the training documentation developed in subtask 5 and experience gained during implementation.

The estimated level of effort required for this subtask is approximately 6 1/2 manmonths over 2 months. Contractor/Air Force personnel effort is estimated at approximately 3 1/2 manmonths for the provision of test support. Air Force personnel effort of approximately 3 manmonths will be required for developing the acceptance test data, loading data, and conducting the test.

6. SUBTASK 6: Collect and Load Data

The objective of this subtask is to collect the data necessary to support the system and to load the data into the system. Data reporting procedures would be established and methods for reviewing and validating the data developed. The data would be loaded into the system and prepared for operation. Data collection, validation, and entry would be ongoing requirements throughout the operational life of the system.

The estimated level of effort required to collect and load the initial set of data is estimated to be approximately 7 manmonths over 4 months. Contractor/Air Force personnel effort necessary to coordinate and perform the collection and loading of data is estimated to be 2 manmonths. Air Force personnel effort required for supervision, collection, review, and loading of data is estimated to be approximately 5 manmonths.

C. Personnel Support Requirements

Continued operation of the system would require one officer in the grade of O3 or O4 on a one-quarter to one-third time basis to act as system manager. This person could be in one of the manpower, personnel, or training specialty areas if primary responsibility is user interface. If this person is also to have responsibility for system modification or enhancement, he/she should be in the data processing field. The system will also require the services of one full-time data technician to validate and enter data and process user requests. This person should be a five-level person with AFSC 51150.

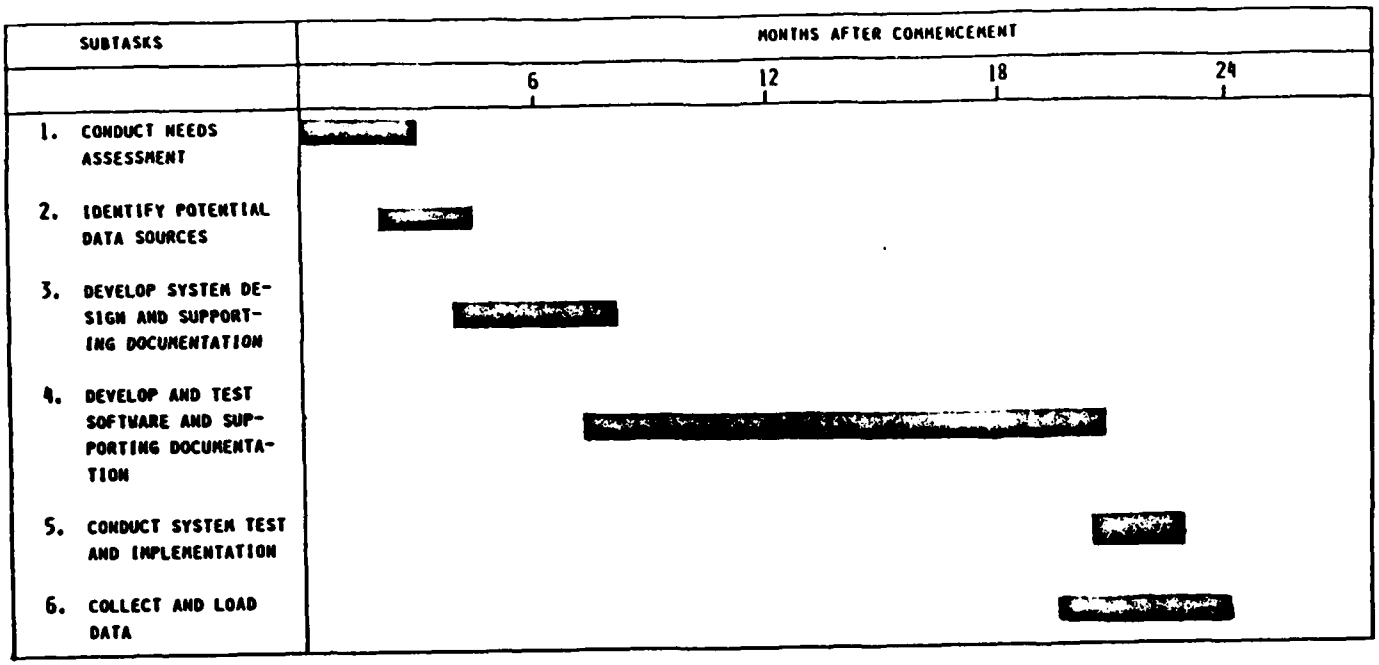
D. Level of Effort for Implementation

The duration of the implementation effort will be approximately 24 months and will require both personnel and data processing resources to complete the project. Exhibit X-5 is a Gantt chart illustrating the time phasing of the six subtasks.

Exhibit X-5

TASK 9 GANTT CHART

Develop MPT Assessment and Aggregation Capability



1. Personnel Resources

- Contractor/Air Force Personnel:

  A total effort of 48 manmonths would be required to design, develop, test, and implement the system.

- Air Force Personnel:

  One contract technical monitor would be required on a quarter-time basis to manage system development and testing. In addition, one data technician (AFSC 51150) would be needed on a full-time basis for the last 6 months of the project to collect, validate, and enter data. The total estimated Air Force personnel effort is 15 manmonths.

2. Data Processing Requirements

Implementation of the aggregation and assessment system will require data processing resources with the following features:

- Hardware
  - One 32 bit (MB) Central Processing Unit;
  - Two 30 megabyte disk drives;
  - One 9-track 1600 BPI tape drive;
  - Two CRT terminals;
  - One computer operator's terminal;
  - One 132 column printer.

- System Software
  - On-line data base management system;
  - Editor;
  - COBOL compiler;
  - Linkage editor;
  - Peripheral communication.

Appendix A

ABBREVIATIONS AND ACRONYMS

AF/IN	Air Force Deputy Chief of Staff, Intelligence
AF/LE	Air Force Deputy Chief of Staff, Logistics and Engineering
AF/LEY	Air Force Directorate of Maintenance and Supply
AF/LEYE	Air Force Acquisition Logistics Communications Group
AF/LEYM	Air Force Maintenance Policy Division
AF/MEA	Air Force Management Engineering Agency
AF/MP	Air Force Deputy Chief of Staff, Manpower and Personnel
AF/MPM	Air Force Directorate of Manpower and Organization
AF/MPP	Air Force Directorate of Personnel Programs
AF/MPPP	Air Force Force Programs Division
AF/MPPT	Air Force Training Programs Division
AF/MPX	Air Force Directorate of Personnel Plans
AF/MPXXX	Air Force Long Range Personnel Planning Branch
AF/RD	Air Force Deputy Chief of Staff, Research, Development & Acquisition
AF/RDQ	Air Force Directorate of Operational Requirements
AF/RDQM	Air Force Requirements, Programs and Studies Group
AF/RDXM	Air Force Management Policy Division
AF/XOO	Air Force Directorate of Operations
AF/XOX	Air Force Directorate of Plans, DCS Plans & Operations
AFDAP	Air Force Designated Acquisition Program
AFHRL	Air Force Human Resources Laboratory
AFLC	Air Force Logistics Command
AFM	Air Force Manual
AFMPC	Air Force Manpower and Personnel Center
AFP	Air Force Pamphlet
AFPOM	Air Force Program Objectives Memorandum
AFR	Air Force Regulation
AFSARC	Air Force Systems Acquisition Review Council
AFSC	Air Force Systems Command or Air Force Specialty Code
AFSC/AL	AFSC Deputy Chief of Staff for Acquisition Logistics
AFSC/ALX	AFSC Policies and Programs Directorate
AFSC/ALXL	AFSC Acquisition Policy Division
AFTEC	Air Force Test and Evaluation Center
ALCM	Air Launched Cruise Missile
ALD	Acquisition Logistics Division
ASD	Aeronautical Systems Division or Assistant Secretary of Defense
ASSET	Acquisition of Supportable Systems Evaluation Technology
ATC	Air Training Command
ATF	Advanced Tactical Fighter
AWACS	Airborne Warning and Control System
BA	Budget Authorization
BIT/FIT	Built-In-Test/Fault Isolation Test
CAIG	Cost Analysts Improvement Group
CDB	Consolidated Data Base
CMET	Command Management Engineering Team
CONUS	Continental United States

DAE	Defense Acquisition Executive
DCP	Decision Coordinating Paper
DCS	Deputy Chief of Staff
DIA	Defense Intelligence Agency
DPML	Deputy Program Manager for Logistics
DSARC	Defense Systems Acquisition Review Council
DSB	Defense Science Board
DT&E	Design Test and Evaluation
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
ECM	Electronics Counter Measures
EPA	Extended Planning Annex
FMC	Full Mission Capable
FMET	Functional Management Engineering Team
FSED	Full Scale Engineering Development
FTD	Field Training Detachment
FYDP	Five-Year Development Plan
GLCM	Ground Launched Cruise Missile
HARDMAN	Manpower/Hardware Integration (Navy)
HIS	Hardman Information System (Navy)
HOI	Headquarters Operating Instruction
HQ USAF	Headquarters U.S. Air Force
ICA	Independent Cost Analysis
ICAP	Independent Cost Analysis Program
ICS	Interim Contractor Support or Independent Cost Study
ILS	Integrated Logistics Support
ILSM	Integrated Logistics Support Manager
ILSP	Integrated Logistic Support Plan
IOC	Initial Operational Capability
IPS	Integrated Program Summary
ISD	Instructional Systems Development
ISP	Integrated Support Plan
ISR	Independent Sufficiency Review
JCS	Joint Chiefs of Staff
JMSNS	Justification for Major System New Starts
LCOM	Logistics Composite Modeling
LE	Deputy Chief of Staff, Logistics and Engineering
LMI	Logistics Management Institute (Washington, D.C.)
LMM	Logistics Manpower Model
LRU	Line Repairable Unit
LSA	Logistics Support Analysis
MAJCOM	Air Force Major Command
MAS	Management Advisory Study
MCSP	Mission Completion Success Probability
MENS	Mission Element Need Statement
MEP	Management Engineering Program
MET	Management Engineering Team
MIST	Man Integrated System Technology (Army)
MMH/FH	Maintenance Manhour per Flight Hour
MMPF	Maintenance Manpower Programming Factor
MMS	Munitions Maintenance Squadron
MPT	Manpower, Personnel and Training

MRA&L	Manpower, Reserve Affairs and Logistics (ASD for)
MRDM	Manpower Requirements Determination Methodology
MRP	Milestone Review Package
O&M	Operations and Maintenance
O&S	Operating and Support
OASD	Office of Assistance Secretary of Defense
OJCS	Office of the Joint Chiefs of Staff
OJT	On the Job Training
OPR	Office of Primary Responsibility
OSAF	Office of the Secretary of the Air Force
OSD	Office of the Secretary of Defense
OT&E	Operational Test and Evaluation
PA	Program Authorization
PDM	Program Decision Memorandum
PDP	Program Decision Package
PEM	Program Element Monitor
PEP	Productivity Enhancement Program
PES	Productivity Enhancement Study
PM	Program Manager
PMD	Program Management Directive
PMP	Program Management Plan
POM	Program Objectives Memorandum
PPAC	Product Performance Agreement Center
PPBS	Planning, Programming and Budgeting System
PRP	Phase Review Package
PSOC	Preliminary Systems Operational Concept
R&D	Research and Development
R&M	Reliability and Maintainability
RAG	Requirements Assessment Group
RFP	Request For Proposal
RRG	Requirements Review Group
SAC	Strategic Air Command
SAF	Secretary of the Air Force
SAF/AL	Assistant Secretary of the Air Force for Research, Development & Logistics
SAF/ALP	Deputy Assistant Secretary of the Air Force (Acquisition Management)
SAF/FM	Assistant Secretary of the Air Force for Financial Management
SAR	Selected Acquisition Report
SCAR	Systems Command Acquisition Review
SCP	System Concept Paper
SDDM	Secretary of Defense Decision Memorandum
SECDEF	Secretary of Defense
SOA	Separate Operating Agencies
SOC	System Operational Concept
SON	Statement of Operational Needs
SPO	System Program Office
T&E	Test and Evaluation
T. O.	Technical Order
TAC	Tactical Air Command
TED	Threat Environment Description
TEMP	Test and Evaluation Master Plan
TPDMP	Training Program Development Management Plan

TPR	Trained Personnel Requirements
TQR	Training Quality Report
TRDM	Training Requirements Determination Methodology
TTS	Training and Training Support
UAR	Unit Activity Record
UE	Unit Equipage
USDRE	Under Secretary of Defense for Research and Engineering
WSAP	Weapons Systems Acquisition Process
WBS	Work Breakdown Structure

Appendix B

DIRECTIVES, INSTRUCTIONS AND REGULATIONS APPLICABLE TO ACQUISITION-RELATED MPT PLANNING

Directive	Synopsis
DoD Instruction 1120.11 Programming and Accounting for Active Military Manpower 9 April 1981	Establishes standard definitions and uniform policies and procedures for manpower accounting and programming communications produced by DoD components. Defines programming factors to be submitted to OASD (Comptroller) in budget submissions.
DoD Directive 5000.1 Major System Acquisitions 29 March 1982	The principal directive governing system acquisition within DoD. Establishes policies and responsibilities. Defines milestone requirements during the acquisition cycle. Establishes the DSARC.
DoD-Instruction 5000.2 Major System Acquisition Procedures 19 March 1980	Expands on DoDD 5000.1. Identifies advisors to the DSARC and defines requirements for the JMSNS, SCP, DCP and IPS. Establishes requirements for manpower and training participation in the DSARC.
DoD Directive 5000.35 Defense Acquisition Regulatory System 8 March 1978	Establishes policies and procedures governing DARS, DAR Regulations, and DARC. Defines how submissions for substantive changes to DARS policies and procedures are to be made by DoD organizations, federal agencies, and the private sector.
DoD Directive 5000.39 Acquisition and Management of Integrated Logistic Support for Systems and Equipment 17 January 1980	Establishes policy and responsibilities for ILS, including manpower planning as an inherent part of major system acquisitions. Defines the LSA process and the ILS considerations for each milestone in the acquisition process.
MIL-STD-1388-1A Logistic Support Analysis 25 January 1983	Establishes uniform DoD-wide criteria and provides task descriptions governing performance of LSA, including MPT requirements.

Directive	Synopsis
AFR 8-10 Special Publications Systems - Air Force Manpower Standards (AFMSs) 22 June 1979	Institutes the AFMS system of managing AFMS publications, including descriptions of AFMEA's responsibilities, and AFMS formatting, numbering and distribution systems.
AFR 23-2 Air Force Logistics Command (AFLC) 24 February 1978	Defines AFLC's mission, its relationships to other commands and agencies, and direct communications authorities. Assigns primary responsibilities to the AFLC Commander.
AFR 25-5 Air Force Management Engineering Program (MEP) 1 April 1982	Defines policies and procedures for application of the MEP, including manpower standards development, skill and grade requirements forecasting, work measurement and use of the LCOM.
AFR 25-8 Logistics Composite Model 3 November 1978	Assigns responsibilities for developing, controlling and using LCOM. Establishes the LCOM Steering Committee and defines scenario requirements for LCOM use.
AFR 26-1 Manpower Policies and Procedures 2 October 1981	Establishes policies and procedures for determining, programming and using Air Force manpower resources. Includes procedures for determining manpower requirements, use of standards and grade authorizations and programming and allocating manpower resources.
AFR 26-2 Manpower Organization Policy and Guidance 6 January 1982	Describes general Air Force organizational principles, objectives and policies. Explains the levels of Air Force organization, and establishes a standard nomenclature for command, staff, and operating elements. Establishes relevant procedures for establishing and changing organizational elements and for administering units and establishments. Illustrates the standard structures for wing and base level organizations.

Directive	Synopsis
AFR 26-6 Manpower and Organization Management 7 May 1973	Describes the fundamental manpower objectives and general manpower policy of all Air Force Activities. Assigns specific manpower responsibilities to HQ USAF, MAJCOMs, and Separate Operating Agencies (SOAs).
AFR 28-3 War Planning - USAF Operation Planning Process 18 February 1982	Provides guidance and responsibility for all types of Air Force and multi-service war plans. Outlines the manpower and personnel planning subsystem in the war planning process.
AFR 35-1 Military Personnel Classification Policy (Officers, Warrant Officers, Airmen) 1 April 1981	Describes the policies, procedures, responsibilities, and terminology associated with personnel classification.
AFR 39-1 Enlisted Personnel - Airman Classification 1 January 1982	Describes the occupational, classification structure of Air Force airman force, including Air Force specialty (AFS) descriptions and concomitant Air Force specialty codes (AFSCs) for each group of positions. Prescribes how changes to the classification system are to be made.
AFR 50-8 Instructional System Development 10 July 1981	Establishes ISD policy and responsibilities. Suggests a format for the Training Program Development Management Plan. States that ISD be included in the acquisition process and be taken into account in new program cost estimates.
AFR 50-11 Management and Utilization of Training Devices 11 October 1977	Sets Air Force policy and assigns responsibilities for procuring and managing training equipment. Identifies weapon systems development as a justification for requesting new training devices.

Directive	Synopsis
AFR 50-32 Reporting, Publishing and Maintaining Training Course Data 30 October 1969	Assigns training reporting responsibilities to commanders engaged in flying training, formal technical training, or special training. Assigns ATC's and HQ USAF's (AF-ADA) training course data maintenance and publication responsibilities.
AFR 50-38 Field Evaluation of Education and Training Programs 20 July 1981	Establishes a field evaluation system as a means of evaluating formal AF courses and graduates. Assigns field evaluation responsibilities. Prescribes the use of the Training Quality Report (TQR).
AFR 57-1 Statement of Operational Need (SON) 12 June 1979 (Under revision. Letter of Instruction provides current guidance: Air Force Operational Requirements and Program Development Process, 27 August 1981)	Establishes and assigns responsibility for developing, submitting, and validating the SON. Identifies SON format and utilization requirements. Specifies MENS format.
AFR 80-5 Air Force Reliability and Maintainability Program 9 August 1978	Sets the policy and guidelines for the Air Force R&M program, in the areas of requirements development, management, and performance reporting. Empowers the imposition and enforcement of R&M requirements and characteristics in development and production contracts. Outlines R&M program participation in each phase of a system's life cycle.
AFR 80-14 Test and Evaluation 12 September 1980	Defines the concepts and general policy guidelines associated with the Air Force T&E Program in the acquisition process. Implements DoD Directive 5000.3. Assigns responsibilities for T&E in the acquisition process.

Directive	Synopsis
AFR 173-11 Independent Cost Analysis Program 12 December 1980	Institutes the Independent Cost Analysis Program (ICAP) and defines it in terms of requisite analyses, procedures, policies, scope and responsibilities. Specifies that independent cost analyses in the acquisition process are to include training investment costs and O&S costs.
AFR 173-13 Air Force Cost Analysis Improvement Group (CAIG) 13 February 1981	Establishes the CAIG. Defines the CAIG's membership and administration, and assigns responsibilities.
AFR 800-2 Acquisition Program Management	Principal Air Force document for management of the acquisition process. Establishes policies and assigns responsibilities to participating commands and agencies. Designates the role of the program manager. Establishes and identifies membership of the AFSARC.
HOI 800-2 Program Management Direction 30 June 1980	Establishes HQ USAF policy and assigns responsibility for documentation related to program management. Establishes the requirement for and specifies the content of the PMD.
AFR 800-3 Engineering for Defense Systems 17 June 1977	Establishes policies and assigns responsibilities for application of an integrated engineering effort phase by phase throughout the acquisition life cycle. Specifies requirements for human factors engineering and logistics engineering, to include maintenance manpower requirements and skill levels.
AFR 800-4 Transfer of Program Management Responsibility 10 March 1975	Establishes policies and assigns responsibilities for the transfer of program management responsibilities from an implementing to a supporting command.

Directive	Synopsis
AFR 800-5 Selected Acquisition Reports (SARs) 6 June 1980	Assigns responsibilities for SARs preparation and reporting to HQ USAF, HQ AFSC, and HQ AFLC in the acquisition of weapon systems. Implements DoD Instruction 7000.3, which outlines SARs purpose, scope and procedures, and provides standardized definitions.
AFR 800-8 Integrated Logistics Support (ILS) Program 7 February 1980	Establishes policies and assigns responsibilities for management of the ILS program. Defines ILS elements, to include MPT, identifies ILS support considerations in the acquisition process, and provides instructions for the preparation of the ILSP.
AFR 800-10 Management of Multiservice and Agency Systems, Programs and Projects 5 July 1978	Authorizes Air Force commanders of implementing and supporting commands to negotiate agreements with and to work with other services and agencies in the management of multiservice and agency systems, programs and projects.
AFR 800-11 Life Cycle Cost Management Program 22 February 1978	Establishes policies and assigns responsibilities for implementing life cycle cost management during the acquisition process. Includes requirements for considering operational and maintenance manpower and training equipment as part of total life cycle cost.
AFR 800-12 Acquisition of Support Equipment 20 May 1974	Establishes policies and assigns responsibilities for the acquisition of equipment to perform the support function, including automatic test equipment, special test equipment, and computer programs and software.

Directive	Synopsis
AFR 800-15 Human Factors Engineering and Management 1 October 1974	Establishes policies and assigns responsibilities for incorporating human engineering, biomedical, manning, test and evaluation, and training aspects and management functions during the acquisition process. Includes requirements to develop and distribute manpower and personnel requirements information, conduct manpower tradeoff studies and assess potential manpower impact of changes in proposed design, and operational or support scenarios.
AFR 800-17 Work Breakdown Structure (WBS) for Defense Material Items 2 May 1975	Establishes policies and assigns responsibilities for developing and applying WBS during the acquisition process.
AFR 800-21 Interim Contractor Support For Systems and Equipment 26 September 1978	Establishes policies for interim contractor support for systems and equipment being introduced through the acquisition process. Includes requirements for contractor studies related to impact on training and support capabilities and manpower requirements.
AFP 50-58 Training Handbook for Designers of Instructional Systems, Volumes I-VI 15 July 1978	Designed to be used by Air Force educational and training personnel in applying the principles of the Instructional System Development (ISD) process.
AFLC/AFSCR 800-24 Standard Integrated Support Management System 27 May 1977	A multi-service regulation which provides a common approach to planning and managing the logistics support for multi-service procurements. Describes the LSA program and establishes the requirement for consideration of personnel and training as logistics factors.

Appendix C

AIR STAFF SECTIONS AND THEIR ROLES IN ACQUISITION-RELATED MPT ACTIVITIES

AF/MPM, Directorate of Manpower and Organization

- Participates in preparation of draft MENS and ensures circulation of draft MENS to all MAJCOMS with manpower resource implications.
- Ensures the PMD has sufficient manpower guidance to accomplish detailed manpower analysis.
- Reviews MRP, PMP, IPS and manpower implications of SON to ensure sufficient manpower data is available for preparation of the DCP for each milestone review.
- Coordinates manpower requirements with the PEM.
- Office of primary responsibility for the LCOM system within the Air Force and chairs LCOM steering committee.
- Assumes responsibility for the manpower requirements portion of LCOM.
- Coordinates and staffs manpower implications of maintenance improvement initiatives.
- Reviews rated manpower authorizations.
- Maintains and manages Air Force listing of unfunded validated manpower requirements.
- Maintains critical military skills list and issues critical military skills management guidance.
- Notifies field activities of annual grade allocations.
- Directs implementation of Air Force standards and adjusts manpower authorizations subject to resource availability.
- Determines distribution of manpower resources when full funding and authorizations are not granted.
- Acts as AF/MP representative to ICA and CAIG.

AF/MPP, Directorate of Personnel Plans

- Validates manpower requirements for submission to the PEM for programming.
- Determines manpower costs of new systems.
- Maintains statutory and administrative ceiling data on authorized grade strengths.

AF/MPPP, Force Programs Division

- Programs quantitative flow of personnel into skills.
- Sizes flow of personnel into training pipelines in response to build of new system inventory.

AF/MPPT, Training Program Division

- Primary Air Staff training focus.
- Manages Air Force training policy documents.
- Coordinates and provides input for the Training Program Development Management Plan.
- Provides policy guidance for the Program Office Training Planning Team.
- Responsible for the program element that funds ATC.
- Air Staff advocate for training equipment requirements.

AF/MPPTS

- Coordinates staffing of PMD for manpower and personnel requirements.

AF/MPX, Directorate of Personnel Plans

- Reviews program documentation for personnel implications.
- Provides personnel constraint input to acquisition program documentation.
- Coordinates policies on long range personnel planning.
- Issues personnel planning guidance to field commands.
- Serves as a member of the Requirements Assessment Group.

AF/RD, Deputy Chief of Staff, Research, Development and Acquisition

- Provides approved LCOM scenarios to concerned agencies prior to DSARC III.
- Member of LCOM steering committee.
- Evaluates application of Air Force reliability and maintainability program to requisition projects.

AF/RDQ, Directorate of Operational Requirements

- Formulates and maintains Air Force policy on the application of work breakdown structure.
- Monitors application of work breakdown structure.

AF/RDQM, Requirements, Programs and Studies Group

- Manages the validation of acquisition documentation.
- Assigns the Office of Primary Responsibility for acquisition documentation.

AF/RDXM, Management Policy Division

- Establishes and issues Air Force policy guidance for the application of human factors engineering.
- Ensures that PMD and other program documentation includes proper human factors engineering guidance.
- Ensures the PMD includes any manpower resource constraints which may influence system planning.
- Office of primary responsibility for program management direction.

AF/RDP, Program Element Monitors

- Assures manpower requirements submitted by MP are programmed in the POM and entered in the FYDP.

AF/LE, Deputy Chief of Staff, Logistics and Engineering

- Establishes Air Force policy for reliability and maintainability of systems in the acquisition process.
- Establishes ILS policy.
- Provides ILS guidance in the PMD.
- Responsible for manpower requirements associated with depot level maintenance.
- Establishes policy for Life Cycle Cost Management.
- Assesses adequacy of life cycle cost estimates for procurement plans, proposal requests and other acquisition documentation.

AF/LEX, Directorate of Logistics Plans and Programs

- Member of LCOM steering committee.

AF/LEY, Directorate of Maintenance and Supply

- Member of LCOM steering committee.
- Coordinates logistic support planning for the operational scenario.
- Develops support and maintenance requirements for the operational scenario.

AF/ACMC, Systems Cost Analysis Branch

- Manages ICA and CAIG process.

AF/XOO, Directorate of Operations

- Responsible for staffing and approval of SOC/PSOC.
- Chairs Priorities Review Group which prioritizes Class V Mods.

Appendix D

ACQUISITION RELATED MPT ACTIVITIES IN OTHER SERVICES

A. Background

The impact of MPT constraints on the acquisition of new systems and equipment recently has become an issue of high visibility within the Department of Defense. Congressional concern, OASD (MRA&L) tasking and the Carlucci memoranda, among other stimuli, have prompted each of the services to embark on efforts to identify and assess the effectiveness of MPT participation in the Weapon System Acquisition Process.

Both the Navy and the Army currently have major projects underway to more fully integrate MPT into the acquisition process. The Navy's HARDMAN project (Manpower/ Hardware Integration) is the longest standing of these efforts and the one closest to widespread implementation. In many ways it can serve as the role model for the other services in developing an MPT-Acquisition program. The Army's MIST (Man Integrated System Technology) project is the most ambitious of those currently under development. It is a broad-scale attempt to integrate manpower, personnel, human factors, training and force structure into the design, development and deployment of new systems. Both of these projects offer valuable lessons for the Air Force in its attempt to more fully integrate MPT concerns into the acquisition process.

B. HARDMAN

The HARDMAN project was undertaken as a part of the Chief of Naval Operations Study and Analysis Program FY 1976/77. The driving force behind the HARDMAN project was the difficulty the Navy was experiencing in providing satisfactory MPT support for the ships and systems it was developing and deploying. The goal of the project was, "...to evaluate the existing manpower/training planning process associated with weapon system acquisition and to develop more effective ways in which to insure early and complete consideration of the tradeoff between manpower/training requirements analysis and equipment design."

Among the findings of the HARDMAN project were:

- Early, effective MPT planning was not being conducted in the WSAP;
- Participants in the acquisition process lacked incentives to conduct effective MPT planning;
- Participants lacked uniform effective methods for making early determination of manpower requirements;
- Participants lacked the ability to identify and aggregate Navy-wide equipment-driven MPT requirements;
- The MPT community was unaware of the total number of projects in the acquisition system which had significant MPT requirements;

- Participants lacked the ability to conduct MPT supportability and affordability assessments of new acquisitions.

The initial HARDMAN study generated significant results in terms of organizational structure and resource commitment. Within the Office of the Deputy Chief of Naval Operations (Manpower, Personnel & Training) (OP-1), the Manpower and Training Plan Analysis Branch (OP-112) was created to deal with acquisition-related MPT issues. Within this branch, specific responsibility for the development of the necessary tools and techniques was given to the HARDMAN Development Section (OP-112C). Concomitant with the creation of the new organizational structure was the decision to invest $10 million and 200 man-years of effort over a seven year period to develop the necessary capabilities to deal effectively with the acquisition-related MPT issues.

Today, the HARDMAN project has produced many concrete results and is on the verge of Navy-wide implementation. A pilot effort to implement HARDMAN developed and sponsored methods is scheduled to begin 1 January 1983. Its successful conclusion one year later will set the stage for total Navy adoption of new and more effective methods of addressing the manpower, personnel and training issues in the acquisition process.

Though there have been numerous major and minor outputs from the HARDMAN project, the most substantial portion of its results are represented by three products. These products are the HARDMAN Information System (HIS), the Manpower Requirements Determination Methodology (MRDM) and the Training Requirements Determination Methodology (TRDM).

HIS is an automated information system maintained by OP-112 on in-house facilities. The system identifies and describes each project in the WSAP which has MPT implications. The system aggregates and projects quantitative and qualitative manpower and training resource requirements, both by individual system and in the aggregate, for a 17-year period. Additionally, the system maintains a list of projected and accomplished acquisition milestones to help insure timely MPT participation.

MRDM and TRDM are similar in purpose though they differ in the resource to which are they are applied. MRDM deals with manpower requirements and TRDM with training requirements. Both are intended to provide the project manager with a uniform, easily-used methodology for making an early estimate of resource requirements and revising this estimate as the design and the operational and support concepts evolve during the acquisition process.

There are many lessons from the HARDMAN project which can be applied to the Air Force effort. Among these are:

- Establishment of an organization whose primary purpose is to serve as focal point of acquisition-related MPT issues;

- Development of an automated system to track acquisition programs and their related MPT requirements. Many of the principal parts of HIS are applicable to Air Force needs;

- Involvement of anticipated or potential users in the development efforts. Some HARDMAN components have been developed in isolation from the intended users. This results in a lack of commitment to the product on the part of the intended

user and makes a last minute "sales" effort necessary. Additionally, the developer does not benefit from the experience and insight of the user;

- Development of comprehensive, detailed goals to include interim objectives. Failure to develop and apply a complete, detailed plan caused some false starts and misdirected efforts;

- Strict management and monitoring of contractor efforts. Some contractors were given only vague or generalized task statements and were not closely monitored during the development effort. As a result, some efforts were not congruent with the goals of the project and required extensive revision;

- Development of timely contracting procedures. Failure to anticipate contracting delays and institute a timely contracting management plan resulted in follow-on contracts not being in place when funded work was completed. Delays of several months awaiting contract documents were not uncommon;

- Basic concepts developed for Navy MPT supportability and affordability assessments can be applied to Air Force needs.

C. MIST

The Army MIST project was undertaken during CY 1981 with the stated objective of "developing a system which integrates manpower, personnel and training (MP&T) considerations throughout the weapon system acquisition process (WSAP) to assure the effective planning and utilization of our projected manpower resources for operational readiness." Though it is still in the early stages of development, MIST is, in many ways, more ambitious than either HARDMAN or current Air Force efforts. The scope of MIST includes not only MPT forecasting and analysis, but also training system design, test and evaluation, and anthropometric assessment of design alternatives.

There are four major areas in which MIST will develop applicable technology and management procedures:

- Treatment of human resources as a performance and cost factor during concept formulation;

- Planning and forecasting MPT information;

- Parallel development of weapons systems and associated training systems;

- Specification of test and evaluation issues to assure accountability and support the program review process.

The MIST project is intended to integrate and demonstrate the technical relationships among these factors, provide the necessary methodologies to assure effective treatment during the design process and demonstrate the relationship to life cycle system management. An additional goal of MIST is to develop automated data bases, systems, and models to support full integration of MPT considerations in the acquisition process.

Though the MIST project is still too early in its development to draw firm conclusions, its scope and intended goals indicate its potential application to Air Force requirements. MIST is planned as a five year project and should be closely monitored by the Air Force to allow for review and adoption of any applicable results.

Appendix E

LOGISTICS COMPOSITE MODELING (LCOM)

A. Background

The LCOM is a large-scale computer simulation model used to simulate aircraft operation and main supporting functions. LCOM is used to determine logistics support requirements for newly developed weapon systems. Though LCOM has the potential for being used with any system that has repetitive missions or maintenance actions, it is currently structured only for aircraft systems.

An important aspect of LCOM is its ability to project aircraft maintenance manning requirements. It determines direct labor requirements for hands-on aircraft maintenance performed in applicable shops. LCOM does not consider shop overhead or other nonmaintenance support functions. LCOM determines requirements only for aircraft specific maintenance actions; it does not model depot level or general use shops.

There are two basic assumptions related to LCOM determination of manpower requirements. The first assumption is that all maintenance personnel are skill level five or fully qualified. The second assumption is that each maintenance action may be identified with a specific AFSC or group of AFSCs.

LCOM has two additional features related to manpower determination. It may be used to identify manpower needs for both wartime and peacetime operations. Additionally, LCOM may be used to model the effect of manpower shortages on maintenance levels and sortie generation.

LCOM is applied to determine the maintenance manpower requirements of developing aircraft systems which will require DSARC review (may also be applied to AFDAPs if directed). It develops and updates the maintenance manpower requirements for FYDP resource programming.

B. Management

The primary Air Force regulations which govern LCOM are AFR 25-8, Logistics Composite Model (LCOM), and AFR 25-5 (Volume IV), Air Force Management Engineering Program (MEP). AFR 25-8 assigns responsibilities for use and control of LCOM, establishes an LCOM Steering Committee for system improvement and establishes procedures for development of improved scenarios. AFR 25-5 (Volume IV) describes manpower standards development and reporting and LCOM simulation procedures.

The Air Force Office of Primary Responsibility for LCOM is the Directorate of Manpower and Organization (AF/MPM). AF/MPM also chairs the LCOM Steering Committee which recommends policy for LCOM applications and proposes system modifications or enhancements. Other members of the LCOM steering committee include:

- HQ USAF
  - — Directorate of Logistics Plans and Programs (AF/LEX)
  - — Directorate of Maintenance and Supply (AF/LEY)

- — Directorate of Data Automation
- — Deputy Chief of Staff, Research, Development and Acquisition (AF/RD)

- Air Force Major Commands
- Special Agencies
  - — AF Logistics Management Center (AFLMC)
  - — AF Test and Evaluation Center (AFTEC)
  - — AF Management Engineering Agency (AFMEA)
  - — AF Maintenance, Supply and Munitions Management Engineering Team (AFMSMMAT)
  - — AF Human Resources Laboratory (AF/HRL)
  - — Air Force Manpower and Personnel Center (AF/MPC).

AFMEA processes and approves maintenance manpower requirements and standards and monitors all official LCOM studies which impact those areas. AFMEA evaluates and publishes LCOM procedures and programming documents and documents and implements changes to LCOM software related to standardized maintenance manpower.

C. LCOM Scenario

The LCOM simulation scenario is developed in response to the Air Force operational scenario provided by HQ USAF. Prior to DSARC III, Air Force operational scenarios are provided by the Deputy Chief of Staff for Research, Development and Acquisition; subsequent to DSARC III, AF/MPM provides the approved scenarios.

The actual LCOM operating scenario is usually developed in conference between the Aeronautical Systems Division (ASD) of AFSC, AFTEC, the SPO, and the using command. Scenario development and coordination is critical to effective utilization of LCOM.

There are nine primary areas in which information is required for scenario development. These are:

- General Requirements - organization level and unit equipage (UE), manpower availability, standard manning for work centers not simulated;
- Facilities and Deployment - number of locations and UE size at each site, supply concept, resupply time, maintenance concept;
- Mission Requirements - aircraft types and configuration, mission priority, flight sizes, sortie rate and length, environmental limitations, acceptable delay parameters;

- Operations and Scheduling Policy - minimum conditions for launch and recovery, conditions for air abort, aircraft utilization;
- Ground Alert - number of aircraft, number and frequency of missions flown from alert, replacement policy, alert profile;
- Functional Check Flight - required conditions, limitations, duration and probable range of variation;
- Maintenance Concepts and Organization - organization structure and AFSC structure, quick turn conditions, remote vs. home station maintenance, repair level concept;
- Combat Damage - threat environment, repair augmentation, policy for allocating repair;
- Other Assumptions - briefing and debriefing requirements, air crew scheduling rules.

D. LCOM Utilization

Initial utilization of LCOM for a developing aircraft is the responsibility of ASD which develops the initial model. Development of the initial model varies in effort depending on the availability of comparable systems; if total development is required, the effort may take from six to nine months.

The initial task is development of a data base specific to the weapon system being simulated. The maintenance portion of the data base is based on current maintenance concepts and policies, contractor supplied task analysis data, SPO and design engineer assessments, ASD performed task analysis, and comparability analysis, if available.

Comparability analysis is the use of an existing piece of equipment which is similar in use, design and operating environment to project the corrective maintenance rates for the system under development. The system chosen for comparability must have sufficient operational and maintenance data available to establish a baseline for projection of maintenance requirements and it must be sufficiently similar to the new system to ensure the validity of those projections.

Comparability analysis is used to estimate LCOM failure clocks prior to operational test and evaluation. Comparability analysis is used to assess, adjust, or in place of contractor estimates which may not represent Air Force experience. Contractor estimates are generally based on a more experienced and qualified work force than is available to the Air Force and include only direct maintenance resulting from operational failure.

ASD retains control of the model until such time as the new system enters inflight testing. At this time control of the model shifts to AFTEC for input of flight test data. When the new system becomes operational, control shifts to the using command. At any time during the development process, any interested agency (AFTEC, ATC, TAC, etc.) may utilize LCOM to make manpower projections. Control of the model refers to the responsibility for maintaining the LCOM data networks.

E. Function

LCOM is a Monte Carlo simulation model which projects direct maintenance manpower for aircraft systems. Utilizing a system-specific data base, the model completes a series of iterative runs with selected variables such as manpower, spares, and ground support equipment changed between iterations. The results of the various runs are compared and evaluated and the process is continued until the target sortie rate is obtained with a minimum resource expenditure. At the completion of the simulation, the results are converted to manpower requirements through the regression and manpower programs.

The manpower requirements generated by LCOM simulation are combined with minimum manning levels for work centers, overhead, support and supervision requirements, grade structure requirements, work centers manned by separate standards, and the aircraft flying program. These elements are input data for the manpower program which generates the basic authorization for a given operations program. Manpower requirements thus generated are identified by paygrade, AFSC and position within the organization.

A detailed discussion of the computer logic associated with LCOM is contained in AFR 25-5 (Volume IV).

Appendix F

AIR FORCE MANAGEMENT ENGINEERING PROGRAM (MEP)

A. General

The Air Force Management Engineering Program (MEP) is designed to provide the functional manager with technical assistance for improving productivity and determining standardized manpower requirements as a basis for more effective utilization of manpower resources. The HQ USAF OPR for MEP is the Directorate of Manpower and Organization (AF/MPM) and the program is implemented by the Air Force Management Engineering Agency (AFMEA). The primary reference in the application of MEP is AFR 25-5, Air Force Management Engineering Program, 1 April 1982 (Volumes I, II, IV). Volume I discusses policy, responsibilities, and requirements; Volume II discusses techniques and procedures; Volume IV discusses LCOM; there is no Volume III.

B. Objectives

MEP has four primary objectives; these are:

1. Contribute to improved Air Force combat readiness by providing alternatives which will enhance operational effectiveness and work center productivity in response to mission needs and consistent with Air Force objectives.

2. Provide and maintain a scientifically based, systematic process to determine work center manpower requirements.

3. Provide the ability to project aggregated manpower requirements for use in the PPBS process.

4. Provide commanders and functional managers with manpower productivity information on which to base analysis of past performance trends and forecast further requirements.

C. Organization

Activities and functions associated with MEP may be grouped into three broad categories. These are:

- Productivity Enhancement Program,
- Development and Maintenance of Manpower Standards,
- Programming Models.

The Productivity Enhancement Program (PEP) is designed to improve operational effectiveness through increased productivity accomplished by reducing operating costs or increasing capability at a reduced unit cost. PEP is made available to functional managers as a consultant service from AFMEA.

Manpower standards are developed to set the most valid work center manhour-to-workloads relationships and mission-related manpower needs. Standards are built through the use of detailed work measurement methods and statistical analysis of historical data based on the premise of common work within functions. Standards maintenance begins with the approval of a new standard and continues throughout its life. Maintenance is intended to ensure that standards remain responsive to mission changes and program evolution.

Programming models are quantitative tools used to determine functional manpower requirements within an Air Force Program element and to forecast FYDP manpower requirements based on changes in major force programs.

D. Management Engineering Team

The primary vehicle for the application of MEP is the Management Engineering Team (MET). There are two general types of METs, the functional MET (FMET) and the command MET (CMET). The FMETs provide services to Air Force functional managers for common activities which cross command boundaries and the CMETs provide services to functional managers within a particular MAJCOM.

FMETs are tasked with developing Air Force manpower standards and guides and additionally with developing command standards and supporting command activities when directed by the Air Staff. FMETs review MAJCOM manpower standards and recommend approval or disapproval to AFMEA. They conduct productivity enhancement studies and assist in the development of performance work statements. FMETs determine the manpower impact of changes to functional directives and evaluate their effect on existing manpower standards.

CMETs advise and assist local commanders and functional managers on effective management of manpower resources. They develop MAJCOM and Air Force manpower standards and guides and perform productivity enhancement studies. CMETs provide management advisory services and audit the accuracy of workload factor data provided by functional OPRs.

E. Feasibility Study

The feasibility study is the first step in both the productivity enhancement program and the development and maintenance of manpower standards. It is initiated at the request of either the functional or manpower manager to meet an identified need for improved operations or a more accurate definition of manpower requirements. It is a decision making process for choosing from alternative courses of action.

The feasibility study has seven objectives:

- Identify opportunities for enhanced productivity;
- Evaluate the need for updating existing standards;
- Evaluate the need for new standards for peacetime and/or wartime requirements;
- Assess the suitability of a function to standards development;

- Determine the applicability of wartime functional guidance for standards development or other wartime manpower planning activities;

- Evaluate the costs and benefits of conducting a productivity enhancement study prior to standards development;

- Determine the scope, objectives and resource requirements for subsequent study design.

F. Productivity Enhancement

The Air Force Productivity Enhancement Program (PEP) is designed to improve work productivity. Management engineering support is contributed to PEP through productivity enhancement studies (PESs) and management advisory studies (MASs).

The objective of the PES is to increase productivity by reducing costs or to increase operational capability at the same cost. In either case, the net result is a reduced per unit cost for work performed. As an incentive for implementing PES, resources saved may be reinvested to offset deferred requirements.

A PES may be recommended by the manpower community as the result of a feasibility study or requested by the functional manager to satisfy a perceived need. If requested by the functional manager, the PES must be preceded by a feasibility study to identify the most appropriate approach. A PES may be initiated at base, MAJCOM, or Air Force level.

The PES has three principal uses; they are:

- Assist the functional manager in better defining work;

- Establish efficient and effective in-house operations in advance of a cost comparison study;

- A prerequisite for manpower standards development.

The functional manager has decision authority for the implementation of study recommendations, except that when a PES is recommended as a prerequisite for manpower standards development and agreed to by the functional manager, the results must be implemented prior to starting the standards study.

The MAS is very similar to the PES, but more limited in scope. The MAS is generally requested and implemented at the individual base work center level and the results are generally applicable only to that base. Certain activities, such as a separate productivity enhancement plan, which are required by a PES are optional under a MAS.

The productivity study process consists of four phases:

- Design Phase - consists of development of a productivity enhancement plan which specifies the objectives, responsibilities, available tools and study team members;

- Design Gathering Phase - consists of examination of the existing conditions through work sampling, operational audit, interviews, and review of documentation and historical data;

- Analysis Phase - consists of study of existing operations, relationships, and procedures through such techniques as flow process charting, layout analysis, and shift profile analysis; includes an assessment of the impact of planned improvements;

- Formulation and Presentation of Results - consists of developing solutions which meet the client's needs and document study results; includes development of a detailed implementation plan.

The productivity study team should assist in implementing the results of the study and should also conduct periodic follow-up visits to assess the continued relevancy of the recommendations.

G. Manpower Standards Development

The purpose of a manpower standard is to provide a basis for the effective distribution and use of Air Force manpower resources. Standards are developed in order to determine a work center's manhour-to-workload relationship. Manpower standards may be categorized in two methods, by application and by classification.

A manpower standard which applies to only one location is called a command single location standard. A standard which applies to multiple locations within a single command is a MAJCOM standard. One which applies to multiple locations in more than one command is an Air Force standard.

Manpower standards are classified according to the method used in their development and their statistical precision. Standards are classified into three types referred to as Types I, II and III.

Type I standards are developed by determining manhours required to do a job through the use of standard time data, time study, work sampling, or a combination of these techniques. At least 80 percent of the manhours in the standard must be based on these engineered methods. The resulting standard is developed by regression analysis and must satisfy specific statistical measures of accuracy. Type I standards are also termed "engineered" standards.

Type II and Type III standards provide the flexibility required to determine manpower requirements in a variety of work centers when the work is not appropriate for engineered methods. The primary determinant for the classification of these standards is the development method.

When standards are developed using engineered methods and regression analysis, but do not satisfy the statistical requirements for a Type I standard, they are classified as Type II. This classification also applies to standards when operational audit is the primary source of data.

In some work centers, the tasks performed are not suitable to work measurement methods or regression analysis. Alternative development methods and analysis procedures are used to develop valid standards in these areas. In each case, the standard is classified as Type III. Differences between Type II and Type III are procedural and are based on the nature of the work center.

Standards developed without detailed work measurement and based on minimum manpower requirements, staffing patterns, and historical performance are subject to specific constraints to ensure the quality of the standard. Standards built within these constraints are classified as Type III.

Simulation models may be used to determine total work center requirements. When simulation is used, the resulting standard is classified Type III. Simulation used for logistics composite modeling results in a separate classification to clearly identify the use of LCOM.

Standards developed for a single location may be based on ratio unit times. These unit times are built on the ratio of the manhours required to the workload accomplished. Fixed manhours and manhours generated by personnel in the work center are treated separately. This method may also be used for limited cases involving multiple locations when the study population is small. The resulting standards are Type III.

In certain cases where development of manpower standards is infeasible (lack of experience with new system, system to be short lived, etc.) manpower guides may be developed. A manpower guides is an expression of the manpower allocated for a specific workload. Guides are developed through a manpower survey or through an evaluation of planning and programming data, staff estimates, contractor estimates, authorization change requests and similar data sources. Manpower guides may also be used when sufficient time or resources are not available to develop and approve a standard.

Manpower standards are developed in four phases:

- Measurement design;
- Work measurement and data collection;
- Data analysis, computations and model selection;
- Reporting and approval.

The measurement design phase identifies what data is needed and documents how to measure work and collect data. It specifies the techniques to be used in analyzing and reporting data and specifies the degree of measurement precision, management engineering resources to be used, and reporting and coordinating requirements.

The purpose of the work measurement and data collection phase is to obtain the data necessary for standards development. Work measurement is conducted in current conditions and historical workload data are examined.

The purpose of the data analysis, computations, and model selection phase is to evaluate the measurement data, test various mathematical relationships and select the most appropriate quantitative expression of manpower requirements. During this phase specialty, skill and grade requirements are determined and an assessment is made of the impact of the standard.

The manpower standards reporting and approval phase documents the study. It describes models and methods used, describes the work center conditions, documents the data and provides a management tool for functional managers.

H. Manpower Standards Maintenance

The object of standards maintenance is to keep the standard an accurate, efficient tool for determining manpower requirements. The process is the same as for any MEP study.

Standards maintenance activities are undertaken if one of three conditions is met: (1) a productivity enhancement and cost comparison study is planned, (2) according to a preset schedule for standards review, or (3) findings from supplemental work center research indicate a need.

The first step in standards maintenance is a feasibility study. The feasibility study can result in one of four actions:

- The standard requires no change and no further action is needed;
- Only administrative changes are required;
- A standard update study is required to change an existing manhour equation;
- A new standard should be developed.

If a new standard is required, the procedures are the same as for development of the initial standard.

Appendix G

ACQUISITION OF SUPPORTABLE SYSTEMS EVALUATION TECHNOLOGY (ASSET)

A. Background

ASSET is a set of systematic procedures and models designed to support early integration of design, logistics support and operational concepts to achieve the optimum balance between readiness, capability and support at a minimum life cycle cost. Specific objectives of ASSET are:

- Assess cost, human resource and logistics support requirements throughout the system development, deployment and operation;
- Coordinate development of training programs and technical manuals;
- Ensure supportability and manpower requirements are explicitly considered during design tradeoffs and that such considerations are identifiable.

ASSET is a composite of eight analysis procedures, eight computer models and a consolidated data base which supports both. The analytical procedures are the central feature of ASSET; the computer models are used to support application of the procedures. The consolidated data base serves as a single data repository for ASSET applications. The ASSET models and consolidated data base features are resident in the Wright-Patterson Cyber 74 computer system and are readily available to any authorized user. Exhibit G-1 depicts the components of the ASSET methodology.

A detailed description of ASSET is contained in the Air Force Human Resources Laboratory document "ASSET User's Guide (Application)," 7 August 1982.

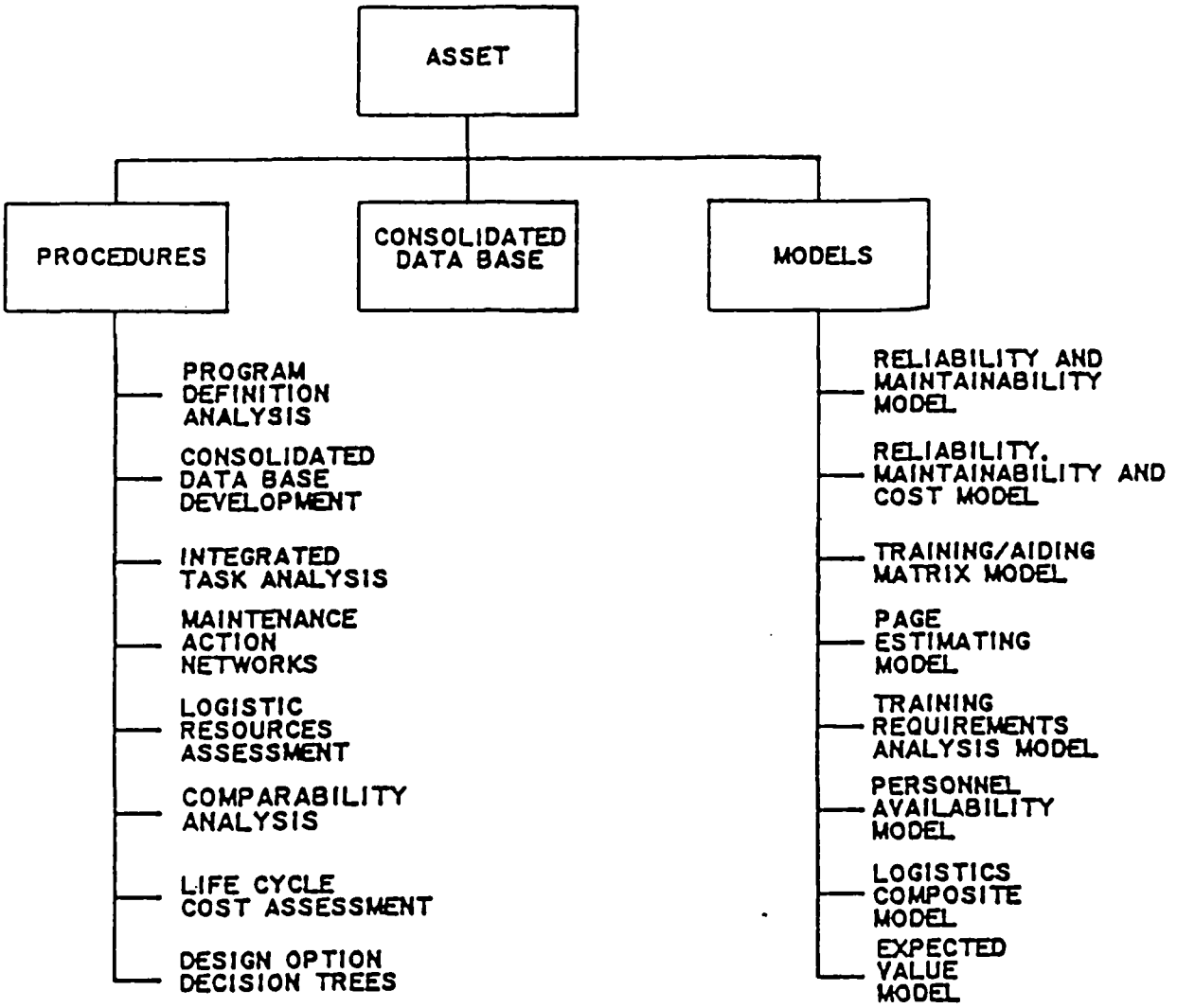
B. Procedures

ASSET contains eight procedures which may be applied consecutively or in parallel to define program requirements, to generate and analyze data, and to perform design support tradeoffs. The ASSET procedures are listed below:

- Program Definition Analysis Procedure
- Consolidated Data Base Procedure
- Integrated Task Analysis Procedure
- Maintenance Action Network Procedure
- Logistic Resources Assessment Procedure
- Comparability Analysis Procedure
- Life Cycle Cost Assessment Procedure

Exhibit G-1

ASSET COMPONENTS



Source: ASSET User's Guide (Application), 7 August 1982

- Design Option Decision Tree Procedures.

Program Definition Analysis is used to create the framework within which ASSET is applied to the weapon system. It consists of a review of external data sources such as the PMP and other program documentation to establish program requirements including a key event and operational readiness schedule, a detailed phase schedule and maintenance action networks. Additionally, as a part of this procedure, initial program and system design data files are created.

A Consolidated Data Base (CDB) is created for each system under consideration; the CDB is necessary for application of ASSET. The CDB is unique for each individual system, though portions of it may be developed from other systems' CDBs where common subsystems or components are involved. The CDB is a single source of all data necessary to analyze the support and manpower implications of the developing system.

The Integrated Task Analysis identifies the requirements for tasks which must be performed during the operation and maintenance of the system. The task analysis is conducted in two parts, the initial task identification and a detailed analysis of the identified tasks. It is used in the development of coordinated training and technical manuals and in the assessment of logistics resources and life cycle costs.

The Maintenance Action Network is used to depict the maintenance flow of a system and describe the resources necessary to accomplish required maintenance actions. The networks identify the possible maintenance outcomes associated with subsystem or Line Repairable Unit (LRU) failure and provide input for models to use in computing maintenance support requirements in terms of crew size, skill categories, skill levels, support equipment and average task duration.

The Logistics Resource Assessment is used to identify and evaluate system-driven logistic resource requirements such as manpower, training, spares, support equipment, etc. This procedure provides maintenance-specific information which may be used in assessing system support requirements.

Comparability Analysis is used to develop data on newly proposed or designed weapon systems by comparison with similar existing systems. Existing system data is adjusted to reflect the unique characteristics of the new systems. This procedure is used to provide a basis for the early application of the ASSET methodology.

Life Cycle Cost Assessment within ASSET is provided by the application of the Reliability, Maintainability and Cost Model. The procedure allows for the use of cost adjustments and perturbations to conduct cost sensitivity analyses.

The Design Option Decision Tree Procedure is used during the tradeoffs conducted during system design and to identify critical design decision points. The procedure depicts the sequence of engineering decisions required for the resolution of a design problem and describes the design options available at each decision point. The Design Option Decision Tree is used in ASSET to facilitate inclusion of MPT and other support considerations in comparison of alternatives and selection of a design approach.

C. Models

There are eight computer models associated with ASSET. Two of these models, LCOM and the Expected Value Model, were developed independent of ASSET and are described elsewhere in this report. The remaining six were developed to support avionics design and have been specifically modified for use in ASSET. These six are:

- Reliability and Maintainability Model,
- Reliability, Maintainability and Cost Model,
- Training/Aiding Matrix Model,
- Page Estimating Model,
- Training Requirements Analysis Model,
- Personnel Availability Model.

The Reliability and Maintainability Model develops R&M parameters for use in initial studies and tradeoff decisions during conceptual development. The model calculates estimates of meantime-to-repair, maintenance manhours, and system and subsystem flightline availability. The model may be used to evaluate the support resource requirements for each element of a system and to rank each element relative to its impact on total system support requirements.

The Reliability, Maintainability and Cost Model estimates the life cycle costs of weapon systems through a set of equipment, reliability, maintainability and cost factors. The model is interactive and allows for perturbation of data for instantaneous sensitivity analysis. A drawback of the model is that it tends to underestimate maintenance manpower costs. It calculates only the cost associated with the performance of direct maintenance; the model has no provision for calculating the manpower cost associated with standby or downtime. However, when properly used, the model provides a good, interactive capability for assessing the cost impact of design and support decisions.

The Training/Aiding Matrix provides an assessment of the formal training and technical manual requirements necessary to support equipment acquisition. It identifies information content requirements for training and/or technical manuals for flightline trouble shooting and nontroubleshooting and shop repair tasks. It identifies the mix of information coverage for training and technical manuals at the subsystem and LRM levels.

The Page Estimating Model is used to determine the quantity and types of pages required for both flightline and shop technical manuals. The model will provide estimates for twelve types of pages (narrative, half-tone art, electronic line art, etc.). It will provide estimates for either conventional or task-oriented manuals.

The Training Requirements Model is used in early estimation of training requirements and assessments of alternative approaches to satisfying those requirements. The model establishes task blocks which require training and then generates a training plan which specifies the type of training (i.e., school or OJT) and methods and media to be used. The model also constructs a training program which establishes schedules and resource requirements. One drawback of the model is the requirement for considerable participation by a highly skilled training analyst to prepare input data and evaluate output; however, the value of the model in developing early training estimates should outweigh this requirement.

The Personnel Availability Model is a predictive model which provides estimates of future personnel population in thirteen maintenance AFSCs. This model has several serious limitations which significantly reduce its utility. The model is based on data

elements from 1975 and 1976 Unit Activity Record (UAR) files; there is no provision for updating accession rates, loss rates or flow rates to reflect current circumstances. The period of data coverage is not long enough to serve as a basis for making projections of any great confidence. Data related to AFSCs cannot be modified to reflect new, modified or deleted skills. There is no provision for modeling the effect of variations in pay, bonuses, rotation policy, etc. Great care should be taken if using this model to ensure that the results are not accepted with greater confidence than warranted.

D. Summary

ASSET provides the acquisition community with an easily used set of tools for supporting the assessment of system-driven MPT requirements. ASSET's greatest asset is its ready availability made possible through its residence on the Wright-Patterson computer system.

Appendix H

ACQUISITION MANPOWER PLANNING: THREE CASE STUDIES

A. Introduction

During the period 1978-80 the Assistant Secretary of Defense, Manpower, Reserve Affairs and Logistics sponsored a series of studies to examine the manpower planning associated with major aircraft acquisitions. The aircraft acquisitions examined included the F-16, A-10 and E-3A (AWACS). The studies were done under contract by the Logistics Management Institute (LMI) of Washington, D.C. This appendix presents a condensation of those studies and attempts to correlate them to the findings contained in this report.

The studies concentrated strictly on wing level maintenance manpower. No analysis was done of wing overhead requirements, logistics support requirements or depot level maintenance requirements.

B. F-16

The F-16 was in many ways a non-standard procurement. It began life as a part of an Advanced Development Prototyping program designed to assist in the development of unique designs and testing of new techniques. The program was not intended to satisfy existing force structure requirements, but rather to explore options for potential future needs. During the design and validation phase of the lightweight fighter prototype, the Secretary of Defense directed the Air Force to suspend prototype testing and choose one of the prototypes for full-scale engineering development. Thus, the F-16 entered the normal acquisition process at roughly the DSARC II point.

During F-16 acquisition, the SPO estimated maintenance manpower requirements six times. The estimates were based on a wing of 72 aircraft and a deployment concept of one 24 aircraft squadron deployed to one site and two 24 aircraft squadrons deployed to another. Manpower estimates were developed utilizing LCOM and work standards; no estimates were made of wing overhead, security, or logistics support manpower.

The first F-16 manpower study was conducted in December, 1974, about three months before DSARC II. Because the configuration was not yet set, LCOM was utilized only for flightline organizational maintenance; manpower requirements for other work centers were based on comparability analysis and work standards. The total maintenance manpower requirements identified were 790 spaces. No estimates were made for the Munitions Maintenance Squadron (MMS) whose requirements would eventually comprise almost 28 percent of the total F-16 maintenance requirements.

A full-scale, though unofficial, LCOM study was conducted in July, 1975. Some task networks were still rough estimates as some major subsystem contracts had not yet been let. The total manpower estimate grew by 100 spaces to 890, though there was still no estimate for MMS.

In October, 1975, the first official LCOM study was completed. This study utilized a new scenario developed by TAC and coordinated with the Air Staff. Manpower requirements declined to 778 spaces and still did not include an MMS estimate.

In October, 1975, a fourth LCOM study was conducted utilizing the same scenario but updating task networks. This study was the first to include MMS estimates and saw a rise in requirements to 1,347 spaces.

A fifth LCOM study was conducted in July, 1977, utilizing a new scenario and updating task networks. The initial estimate was 1,287 spaces; TAC revised this estimate by adding 51 spaces to MMS to give a final total of 1,338 spaces.

An unofficial LCOM study was conducted in October, 1977. This study revised the MMS estimate to 380 spaces while leaving all other estimates at their July, 1977, level; the result of this study was a requirement for 1,366 spaces.*

Because of its early existence as an experimental prototype, no manpower estimates were made until the F-16 approached DSARC II. At this point, the opportunity for meaningful participation in design tradeoff decisions had been largely lost. This underscores the need for early MPT participation in all acquisition programs.

A portion of the variation in manpower requirements can be attributed to design and component changes. These variations largely are beyond the control of the MPT community to prevent, though they can be influenced by MPT participation in component design. A larger portion of the manpower variation is attributed to the several scenario changes. Though there is no indication as to whether MP participated in development of the F-16 scenarios, the opportunity exists for insuring that critical MPT issues are at least considered. By far the largest growth in manpower requirements is attributed to a failure to include the MMS in initial estimates, a possible result of over reliance on LCOM and MMH/FH calculations. This is a serious oversight which should have been prevented by close MPT management. The late estimation of MMS requirements caused a delay in identifying training and personnel requirements and reduced the quality of the support available to the early delivered aircraft. Since the F-16 was delivered during peacetime, the late assessment of MMS requirements did not have serious impact; had the aircraft been delivered during war, the results could have been far different.

C. A-10

The A-10 followed a standard procurement beginning with a 1967 release of an RFP for conceptual development of the A-X attack aircraft. Following DSARC I in 1970, the A-X was approved for prototype development. Prototype testing was conducted between October and December, 1972. Following DSARC II, the A-10 was selected for full-scale development in January, 1973.

According to the A-10 SPO and PEM, there was no requirement for specific A-10 manpower estimates until after DSARC II. In November, 1973, TAC provided ASD with an A-10 scenario for use in LCOM simulation. This study resulted in a maintenance manhour per flight hour (MMH/FH) factor of 13 and indicated a requirement for 777 spaces. As with the F-16, no estimate was made for MMS.

The first maintenance manpower study published by ASD was conducted to support DSARC III B in February, 1976. This study actually consisted of three LCOM simula-

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*Following completion of the LMI study, a major change in the F-16 maintenance concept resulted in a revised estimate of a total of 755 spaces for maintenance requirements (including MMS).

tions, all utilizing the same updated networks but different scenarios. One simulation used the 1973 TAC scenario, while the other two utilized the revised 1975 TAC scenario with one simulation using one base deployment and the other using two base deployment. The MMH/FH factors varied from 12.8 for the 1973 scenario to 23 for the 1975 two base scenario. Manpower estimates were 1,138 spaces for the 1973 scenario, 1,019 spaces for the 1975 one base scenario, and 1,205 spaces for the 1975 two base scenario. Again, none of these estimates included MMS requirements.

In October, 1975, TAC made its first estimate using both revised networks and a revised scenario. This study resulted in a 22.3 MMH/FH factor and a manpower requirement of 1,199. There was still no estimate of MMS requirements.

The final A-10 maintenance manpower study was published by TAC in 1977. This study used both revised networks and a revised scenario. For the first time OT&E data and battle damage estimates were included. The resulting MMH/FH factors were 24.17 with battle damage and 21.44 without. The specific manpower estimate was 1,207 spaces. For the first time an estimate was made of MMS requirements. The final MMS estimate was 369 spaces or about 30 percent of total wing maintenance requirements.

Though the A-10 followed a standard procurement pattern, like the F-16 it suffered from a lack of early MPT participation, with the initial estimates not being made until almost 11 months after DSARC II. Also like the F-16, the first five A-10 manpower studies failed to include estimates for MMS. In the case of the A-10, no MMS estimates were made until November, 1977, seven months after the first A-10s were delivered to the 354th tactical fighter wing and one month after the aircraft achieved IOC for the first squadron.

D. E-3A

The E-3A was a unique procurement in several ways. First, the airframe is a modified version of the commercial Boeing 707-320. Second, the problems associated with the MPT planning were attributed primarily to the onboard command and control equipment rather than the aircraft itself.

The initial DoD decision approving E-3A development occurred in November, 1967; by the time the earliest maintenance manpower estimates were made in 1976, authorization had been given to proceed with production and deployment. The initial estimates were based on a comparability analysis with the KC-135 (also a Boeing 707 airframe); an additive delta of 5 MMH/FH was established for the E-3A to account for on-board avionics. This yielded a total E-3A estimate of 28 MMH/FH, which was converted to a maintenance manpower programming factor (MMPF) of 49 through standard Air Force equations. The MMPF is the number of authorizations per aircraft.

In February, 1977, AFTEC, in coordination with the SPO, TAC, AFLC, and AFMEA, conducted the first E-3A LCOM study. This study resulted in an increase to an MMPF of 64, a growth of almost 30 percent. This increase equates to approximately 250 spaces per wing.

The E-3A suffered several MPT planning problems during its procurement. These problems were the result of several factors which include very late manpower assessments, no Air Force evaluation of early contractor estimates, inexperience in assessing the true manpower requirements associated with state-of-the-art development, and the failure of a major maintenance component (built-in-test/fault isolation test (BIT/FIT)) to perform to specification.

Though some of these elements, such as BIT/FIT performance were beyond Air Force control, most were exacerbated by ineffective MPT management. No early assessments were made of contractor estimates and the Air Force did not become aware of its maintenance undermanning until the first year of operation.

Planning for training support of the E-3A proved to be particularly lacking. Funding for maintenance procedure simulators was deferred during acquisition, forcing some basic technical training to be conducted using operational aircraft. This has resulted in increased training support for the operational units and a lower overall level of competence among maintenance personnel. Additionally, there were no provisions for backup training for the state-of-the-art BIT/FIT. When this unit failed to attain its design goal, there was limited internal capability for radar maintenance. As a result, the Air Force was forced to rely on expensive contractor support while supplementary training courses were planned and developed.

On the positive side, once the additional E-3A requirements were identified and validated, MP reacted quickly to program the additional authorizations and assign the necessary personnel. This reemphasizes the observation that MP is primarily oriented to POM-related issues.

E. Conclusions

The vast majority of the problems cited in these case studies is the result of inconsistent management on the part of those tasked with MPT planning. The Air Force has both the explicit requirement for early and continuous MPT planning and the tools available for conducting it. In almost all cases, the tools were either improperly used or not applied in a timely manner. The low priority usually attributed to MPT considerations is reflected in the fact that decisions were made to proceed with engineering development and even production without reliable MPT estimates. Additionally, there would seem to be an over reliance on the use of LCOM in projecting manpower requirements for new systems. This tendency encourages a delay in requirements determination until a fairly well advanced design exists upon which to base detailed task analysis.

Appendix I

REVIEW OF SYSTEMS ACQUISITION DOCUMENTATION

A. Introduction

The only method currently available for formally reporting MPT information during the acquisition process is through programmatic documentation. This appendix contains an assessment of the MPT information contained in six program documents.* These are:

- Statement of Operational Need (SON);
- Justification for Major Systems New Starts (JMSNS);
- Preliminary System Operating Concept/System Operating Concept (PSOC/SOC);
- Program Management Directive (PMD);
- Decision Coordinating Paper (DCP).

These documents were reviewed for the following eight systems:

- B-1B;
- Ground Launched Cruise Missile (GLCM);
- MX (Horizontal Basing Mode);
- Pave Mover;
- HH-60;
- Weapons Storage and Security System (WS3);
- Precision Location Strike System (PLSS);
- LANTIRN.

The PMD was selected for review because it provides the MPT community an early opportunity to provide guidance and constraint information to the design and development community. The other documents were chosen because they occur early in the acquisition process and have at least minimal requirements for MPT reporting.

The Mission Element Need Statement (MENS) was reviewed for those systems

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*There is no central source for acquisition documentation within the Air Staff and availability varies from system to system. Documents are held by the following organizations (among others): AF/RDQ (SON, JMSNS, MENS, PMD, DCP), AF/XOO (SOC, PSOC), Tri-Service Contract Read Room (DARCOM) (PMD).

The Mission Element Need Statement (MENS) was reviewed for those systems initiated prior to adoption of the current version of DoD 5000.1. For the B-1B, both the DCP and the Integrated Program Summary (IPS) were reviewed.

B. SON

AFR 57-1 directs that the SON is to include expected manpower constraints and training needs. Support goals such as maintenance personnel per objective unit are to be designated. Force structure and force size supportability deficiencies are to be quantified.

In general, MPT information was either not available within the SON or took the form of boiler plate statements such as "tasks will be accomplished by five level personnel," or "additional maintenance personnel may be required by deployment of this system." The only significant MPT data was contained in the HH-60 SON which identified a projected MMH/FH factor based on Army experience with the UH-60A. No meaningful MPT constraints were identified in any SON reviewed.

C. JMSNS/MENS

DoDI 5000.2 directs that the JMSNS include identification of key manpower constraints which may exist.

The JMSNS/MENS for the systems reviewed contained no significant MPT data. Typical of the type of MPT information found is contained in the following statement from the PAVE MOVER MENS. "Manpower, numerical and skill level requirements of the system in the projected work force will influence system design."

D. PSOC/SOC

AFR 51-1 directs that the PSOC/SOC will contain an assessment of manpower requirements in the areas of staff support, operations, maintenance, security police, base operating support and organization. It further states that requirements for training and training equipment will be identified.

MPT information contained in the PSOC/SOC varied from system to system. The WS3 SOC made no estimate of MPT requirements. The LANTIRN and MX SOCs made no estimates of manpower requirements and only generalized statements concerning training. The GLCM SOC identified total manpower requirements by officer, enlisted and civilian; it did not identify AFSC or skill level requirements and did not identify the requirement for new AFSC shredouts. The GLCM SOC did have well-defined training requirements. The B-1B SOC contained only an identification of air crew requirements; limited estimates of security requirements were made. No estimates of requirements for B-1B AFSC shredouts were included. The only training information consisted of a discussion of building the B-1B ISD on the B-1 ISD. The PLSS contained partial identification of numerical manpower requirements; AFSC estimates were made for the ground support portion only. Limited requirements for training were identified.

E. PMD

HOI 800-2 directs that if the system has an impact on manpower the operating command will estimate manpower requirements and indicate major functional areas.

None of the PMDs reviewed contained significant MPT information beyond the statement required by HOI 800-2 that increases in manpower levels are not authorized. The PLSS PMD included a statement that manpower budgets would be submitted as required. No manpower guidance or constraint information was provided in any PMD reviewed.

F. DCP

DoDI 8000.2 directs that the economy of manpower is to be discussed in relationship to selected alternatives.

None of the DCPs reviewed contained any significant manpower information. The B-1B IPS provided gross number manpower estimates by officer, enlisted and civilian, and directs that LCOM be used and that ATC will perform ISD.

Appendix J

RECOMMENDATIONS FOR MODIFICATIONS OF AIR FORCE REGULATIONS

The following recommendations are made for modifying Air Force Regulations to enhance manpower, personnel and training participation in the acquisition process:

- A consolidated AFR should be issued specifying the requirements and responsibilities for MPT participation in the acquisition process. The regulation should include a detailed listing of activities and responsibilities. It should designate a single organization as having overall responsibility for acquisition-related MPT activities and for assessing the Air Force-wide impact of the total acquisition program. Additionally, it should establish requirements for field activities to report MPT data to the Air Staff at specific points in the acquisition process. All responsibilities assigned should be related to milestone decision points.

- Revise AFR 800-2 to assign a single organization the responsibility for managing the acquisition MPT program and to include procedures for managing the Milestone III production design for DoD major systems.

- Revise HOI 800-2 to include MPT reporting procedures in the PMD, and to designate either MPM or RDXM as having primary responsibility for ensuring that the PMD has sufficient manpower guidance and constraint data to accomplish detailed manpower planning and analysis.

- Revise AFR 25-5 to include the conduct of comparability analysis for developing new system requirements.

- Revise AFR 25-8 to give MPM co-equal status with RDQ for LCOM scenario development prior to DSARC III.

- Revise AFR 26-1 to include specific responsibilities and tasks related to determination of manpower requirements for acquisition programs.

- Revise AFR 26-6 to reflect the current structure of the Directorate of Manpower and Organization.

- Revise AFR 57-1 to include specification of requirements for the JMSNS.

- Revise AFR 173-11 and HOI 173-3 to ensure consistency in CAIG Membership.

- Consolidate AFR 800-8 and AFR 800-15 because of similarity of content and intent.

- Revise all applicable AFRs to designate specific staff agencies as having HQ USAF responsibility. All responsibilities assigned should be related to milestone decision points.

Appendix K

FUNCTIONAL REQUIREMENTS FOR AN ACQUISITION MPT FOCAL POINT

The following functional requirements have been identified as being appropriate for an acquisition manpower, personnel and training focal point:

- Act as the Air Force point-of-contact for acquisition-related MPT matters for the SPOs, MAJCOMs, AFTEC, AFMPC, ATC and other applicable commands and agencies;
- Monitor the status of all Air Force acquisition projects (DoD major, AFDAP, minor and modifications) which will have or may have MPT impact;
- Identify, aggregate and project the MPT requirements of each individual project and of the acquisition program as a whole;
- Integrate MPT requirements created by the deployment of new systems with MPT resources released by the retirement of existing systems in order to determine net MPT impact;
- Assess the MPT supportability of the Air Force acquisition program;
- Review, evaluate and assist in the preparation of acquisition documentation (SON, JMSNS, PMD, DCP, ILSP, etc.);
- Assure MPT participation in preliminary design reviews and critical design reviews;
- Coordinate MPT participation in DSARC and AFSARC reviews;
- Coordinate MPT participation in ICA and CAIG reviews;
- Act as an advisor on MPT issues to Systems Command Assessment Reviews (SCAR) and SPO reviews;
- Provide MPT constraint information to the design community, including projected skill shortages and grade limitations;
- Ensure that aggregate manpower requirements for new systems reflect the Air Force skill level profile;
- Issue projected personnel skill inventories to the design community;
- Assess MPT life cycle costs for alternative equipment designs and provide related information to the design community;
- Provide manpower and skill constraint information to the SPO;
- Provide training guidance and training constraint information to the SPO;
- Participate in the development of operational, maintenance and support scenarios and the distribution of related information to the SPO;

- Coordinate manpower requirements with the PEM and validate requirements for POM processing;
- Coordinate MPT requirements in the R&D, user and support PDPs to ensure consideration of total MPT requirements by appropriate Air Force Panels;
- Coordinate utilization of LCOM for MPT applications;
- Act as point-of-contact for the transfer and application of MPT technologies;
- Coordinate and provide input for the Training Program Development Management Plan;
- Monitor and coordinate the acquisition of training equipment;
- Serve as MPT representative on the Requirements Assessment Group;
- Develop standards for MPT inclusion in RFPs, contract documents, and source selection criteria;
- Establish measures of merit and monitor MPT requirements growth during the acquisition process;
- Coordinate MPT participation in the revision of acquisition regulations;
- Coordinate the development of any methodologies, models or information systems necessary to support MPT participation in the acquisition process.

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