

AD743409



UNITED STATES AIR FORCE  
AIR UNIVERSITY  
AIR FORCE INSTITUTE OF TECHNOLOGY  
Wright-Patterson Air Force Base, Ohio

DDC  
RECEIVED  
JUN 20 1972  
RECEIVED  
C

Reproduced by  
NATIONAL TECHNICAL  
INFORMATION SERVICE  
Springfield, Va. 22151

126  
DISTRIBUTION STATEMENT A  
Approved for public release;  
Distribution Unlimited

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) <b>Air Force Institute of Technology, School of Systems and Logistics</b>		2a. REPORT SECURITY CLASSIFICATION	
		2b. GROUP	
3. REPORT TITLE <b>A COMPARITIVE STUDY OF THE FUNCTIONAL RELATIONSHIP BETWEEN THE AIR FORCE PLANT REPRESENTATIVE OFFICE AND THE SYSTEM PROGRAM OFFICE IN DEFENSE SYSTEM ACQUISITION</b>			
4. DESCRIPTIVE NOTES (Type of report and Inclusive dates) <b>Thesis</b>			
5. AUTHOR(S) (First name, middle initial, last name) <b>Douglas D. Stormo (Capt USAF) and James R. Heitz (Capt USAF)</b>			
6. REPORT DATE <b>28 January 1972</b>		7a. TOTAL NO. OF PAGES <b>125</b>	7b. NO. OF REFS
8a. CONTRACT OR GRANT NO.		9a. ORIGINATOR'S REPORT NUMBER(S) <b>SLSR-16-72A</b>	
b. PROJECT NO.		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
c.			
d.			
10. DISTRIBUTION STATEMENT <b>STATEMENT A</b>			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY	
13. ABSTRACT <p>An effective interface between the System Program Office (SPO) and its associated Air Force Plant Representative Office (AFPRO) is essential in the acquisition of major Air Force defense systems. In this study, responses made to a functional relationship questionnaire by SPO and AFPRO personnel are subjected to quantitative and qualitative analysis. Personnel from three major aircraft acquisition programs provided the response data: the C-5A, the F-15, and the B-1. Similarities and differences among these programs, in the area of SPO AFPRO functional interface, are evaluated based on the commentary of the questionnaire respondents and interview subjects. Concluding comments are directed at increasing the effectiveness of the SPO-AFPRO functional interface.</p> <p><u>KEY WORDS:</u></p> <p>Program Office</p> <p>Air Force Plant Representative Office</p> <p>USAF Defense System Acquisition Management</p> <p>Project Management</p>			

DD FORM 1 NOV 65 1473

UNCLASSIFIED

Security Classification

A COMPARATIVE STUDY OF THE FUNCTIONAL  
RELATIONSHIP BETWEEN THE AIR FORCE  
PLANT REPRESENTATIVE OFFICE AND THE  
SYSTEM PROGRAM OFFICE IN DEFENSE  
SYSTEM ACQUISITION

Captain Douglas D. Stormo  
Captain James R. Heitz

SLSR-16-72A

A COMPARATIVE STUDY OF THE FUNCTIONAL RELATIONSHIP  
BETWEEN THE AIR FORCE PLANT REPRESENTATIVE OFFICE  
AND THE SYSTEM PROGRAM OFFICE IN  
DEFENSE SYSTEM ACQUISITION

A Thesis

Presented to

The Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology  
Air University

In Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Logistics Management

by

Douglas D. Stormo, B.S.  
Captain, USAF

James R. Heitz, B.A.  
Captain, USAF

January 1972

This thesis, written by

Captain Douglas D. Stormo

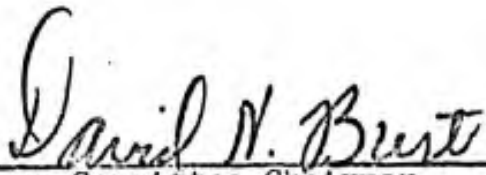
and

Captain James R. Heitz

and approved in an oral examination, has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

Date: 28 January 1972

  
\_\_\_\_\_  
Committee Chairman

## ACKNOWLEDGEMENTS

The authors would like to thank the individuals interviewed in conjunction with this thesis who provided personal thoughts that served to enhance the final text. We would also like to express our gratitude to the questionnaire respondents. The extra time these individuals expended in expressing noteworthy commentary added greatly to the final product.

Special thanks is given to Major David N. Burt, our thesis advisor. His extensive advice in the areas of organization and structure proved to be invaluable.

Mention must also be made of the patience and understanding which was maintained by our wives and families throughout this past year. The typing and proofreading efforts provided by Diane Stormo during the proposal stage deserve special note.

Last, but by no means least, the authors extend a special note of thanks to Mrs. Karen Schnee who typed the final paper.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS . . . . .	iii
LIST OF TABLES . . . . .	vii
LIST OF FIGURES . . . . .	viii

### Chapter

1. INTRODUCTION . . . . .	1
Purpose of the Study . . . . .	2
Importance of the Study . . . . .	3
The Problem . . . . .	3
Related Research . . . . .	4
Background . . . . .	6
Scope . . . . .	18
Objectives . . . . .	19
Research Questions . . . . .	20
Organization . . . . .	20
2. RESEARCH AND ANALYSIS PROCEDURES . . . . .	22
Nature and Sources of Data . . . . .	22
Presentation of the Questionnaire . . . . .	23
Data Collection Techniques . . . . .	24
Data Analysis Procedures . . . . .	26
Binomial Statistical Analysis . . . . .	30
Fisher Exact Statistical Analysis . . . . .	31
Summary . . . . .	32
3. ANALYSIS OF QUESTIONNAIRE RESPONSES . . . . .	34

Chapter	Page
Co-location of SPO Detachment with AFPRO .	36
Designation of Functional Counterparts . .	40
Mutual Understanding of Responsibilities .	41
Coordination of Proposals and Decisions .	44
Rotation of Personnel . . . . .	47
AFPRO Involvement in Validation Phase . .	50
Adequacy of Current Publications . . . . .	53
AFPRO Role in Configuration Control . . .	55
Informal SPO/AFPRO Contacts . . . . .	57
Adequacy of Communication Channels . . . .	59
Utilization of Capabilities . . . . .	61
Timely Resolution of Potential Problems .	63
Geographical Separation . . . . .	66
Duplicated Effort . . . . .	68
Adequacy of the MOA . . . . .	70
Sufficiency of Definition within MOA . . .	73
Establishment of Quality Assurance Requirements . . . . .	74
Status Reporting System . . . . .	77
AFPRO Contract Negotiations . . . . .	79
Joint SPO-AFPRO Meetings . . . . .	81
Summary . . . . .	82
4. FINDINGS AND RECOMMENDATIONS . . . . .	83
Functional Relationship Definition . . . .	83
Organizational and Functional Alignment .	85
Communication Channels . . . . .	86

Chapter	Page
	vi
Management Practices and Problems for Consideration . . . . .	87
Areas for Future Research . . . . .	90
Conclusion . . . . .	92
BIBLIOGRAPHY . . . . .	93
APPENDICES	
A. SPO QUESTIONNAIRE . . . . .	97
B. AFPRO QUESTIONNAIRE . . . . .	103
C. RESPONSE TO QUESTIONNAIRES . . . . .	109
D. C-5A DATA . . . . .	111
E. F-15 DATA . . . . .	113
F. B-1 DATA . . . . .	115
BIOGRAPHICAL SKETCHES OF THE AUTHORS . . . . .	117

## LIST OF TABLES

Table		Page
2.1	SPO Response Data . . . . .	27
2.2	AFPRO Response Data . . . . .	28
3.1	Co-location of SPO Detachment with AFPRO .	36
3.2	Designation of Functional Counterparts . .	40
3.3	Mutual Understanding of Responsibilities .	41
3.4	Coordination of Proposals and Decisions .	44
3.5	Rotation of Personnel . . . . .	47
3.6	AFPRO Involvement in the Validation Phase . . . . .	50
3.7	Adequacy of Current Publications . . . . .	53
3.8	AFPRO Role in Configuration Control . . .	55
3.9	Informal SPO-AFPRO Contacts . . . . .	57
3.10	Adequacy of Communication Channels . . . .	59
3.11	Utilization of Capabilities . . . . .	61
3.12	Timely Resolution of Potential Problems .	63
3.13	Geographical Separation . . . . .	66
3.14	Duplicated Effort . . . . .	68
3.15	Adequacy of the MOA . . . . .	70
3.16	Sufficiency of Definition within MOA . . .	73
3.17	Establishment of Quality Assurance Requirements . . . . .	74
3.18	Status Reporting System . . . . .	77
3.19	AFPRO Contract Negotiations . . . . .	79
3.20	Joint SPO-AFPRO Meetings . . . . .	81

LIST OF FIGURES

Figure		Page
1.1	AFPRO/SPO Relationship . . . . .	9
1.2	ASD/AFCMD Organizational Relationship . . .	12
1.3	"Standardized" SPO Organizational Chart . .	13
1.4	"Standardized" AFPRO Organizational Chart .	14
1.5	SPO-AFPRO Functional Relationship . . . . .	15

## Chapter 1

### INTRODUCTION

The acquisition of major defense systems is a very complex process. The Department of Defense (DOD) long has been aware of the problems involved in managing an acquisition program. Although major efforts have been made to alleviate inefficiencies, many significant problems still exist. Former Deputy Secretary of Defense David Packard assessed the situation in August 1970 when he said, "Frankly, gentlemen, in Defense procurement, we have a real mess on our hands." (24:2)<sup>1</sup>

The multi-million dollar expenditure of public funds for the procurement of major defense systems has received increasing attention from Congress and the general public. The continual emphasis by various news media on cost overruns, schedule slippages and inferior performance has provided additional impetus for key DOD managers to continually evaluate the current management procedures as applied to the acquisition of major defense systems. Reductions in Research and Development budgets have also necessitated a systematic or total systems approach to the

---

<sup>1</sup>The first number refers to the bibliography listing; the second refers to the specific page.

individual acquisition programs and their respective management applications.

### Purpose of the Study

The management approach and organizational structure has varied from one acquisition program to another. The defense system itself obviously introduces a degree of uniqueness to each program. However, regardless of the type of contract or the unique aspects associated with individual programs, all of the programs have certain common objectives of quality, cost effectiveness, maintainability, and supportability.

This research effort attempts to provide some insight into these common areas of endeavor. In addition, it examines some of the more recent management innovations in systems acquisition. The thesis is directed toward the interaction between functional counterparts within the System Program Office (SPO)<sup>1</sup> and the Air Force Plant Representative Office (AFPRO). The perceptions of personnel assigned to current acquisition programs are examined and comparative observations of various aspects of management are made. Finally, suggestions are made with regard to possible resolutions of stated problems.

---

<sup>1</sup>The term "System Program Office (SPO)" will be used in lieu of "Project Office (PO)" as defined in AFSCP 800-3 because of the prevalence of the acronym SPO in recent publications.

### Importance of the Study

The importance of research in the area of SPO-AFPRO functional alignment is exemplified in the magnitude and complexity of current programs. If the utilization of a unique management practice enhances the cost effectiveness of one defense system procurement, it might prove advantageous when applied to other acquisition programs. Therefore, a knowledge of various management approaches and the adequacy of present management tools might enhance the organization and control of future acquisition programs.

This study concentrates on one aspect of the complex acquisition process: the functional relationship between the SPO and the AFPRO. Primary consideration will be placed on the aspects of communication and coordination. It is hoped that the findings can be applied to present acquisition programs and will serve to enhance the success of future programs.

### The Problem

The functional relationship between the SPO and the AFPRO appears to be inadequately defined and delineated. Thus, the working relationship between coordinate SPO-AFPRO organizations is hindered. Misconceptions of SPO-AFPRO functional responsibilities adversely affect program management and impede the acquisition process.

Successful management of complex acquisition programs demands that every effort be made to minimize duplication and to resolve significant organizational problems. Several

steps have been taken to improve the understanding and coordination of interrelated SPO-AFPRO functions, but significant problems still exist.

The Blue Ribbon Defense Panel described the situation as follows:

The policies of the DOD on development and acquisition of weapons have contributed to serious cost overruns, schedule slippages and performance deficiencies. The difficulties do not appear amenable to a few simple cure-alls, but require many interrelated changes in organization and procedures. (8:2)

#### Related Research

Captain Robert L. Holland's thesis, "Role Definition in the Decision-Making Process of Weapon Systems Acquisition," evidenced a lack of understanding by key managers in the area of SPO role definition. Personnel were surveyed at Headquarters United States Air Force (USAF), Headquarters Air Force Systems Command (AFSC), Headquarters Aeronautical Systems Division (ASD), and four major aeronautical System Program Offices. Based on questionnaire responses, the following conclusions were formulated:

1. Generally, there is not a high degree of role definition for those organizations involved in the defense acquisition process.
2. Headquarters Air Force Systems Command does not appear to have a decision-making role in the defense acquisition process, nor does it appear to be as familiar with the roles of other organizations as are the SPO's or Headquarters USAF.

3. The SPO appears to have responsibility for a much wider range of activities than it has authority to directly control. (13)

The comparative analysis of the responses showed that only 58 per cent of the personnel questioned agreed as to who was responsible for a specific area. However, there was 87 per cent agreement as to who "should be" responsible for specific areas of concern. (13)

Major Dale B. Peloquin and Major Arthur J. Roscoe, Jr., in their thesis, "Systems Management in the United States Air Force--A Review and Critical Analysis," enumerated several SPO management problem areas. The authors accomplished a historical review of systems management in the Air Force and compared it to the Army and Navy. Peloquin and Roscoe also presented a review and summary of the current status of Air Force Systems Management. Their emphasis was directed toward the System Program Director and general SPO management strengths and weaknesses. They described program director authority, communication methods, and management procedures as strengths. The organizational structure in which the SPO must operate and the training of the program director were listed as weaknesses. (25)

Lieutenant Colonel Roger T. Kozuma and Captain Frederick T. Dehner presented a treatise on the AFPRO role and the AFPRO-SPO relationship during the weapon system acquisition process. Their thesis, "The Role of the Air Force Plant Representative Office in the Weapon System Acquisition Process," provided a historical development of

the AFPRO and SPO organizations and an analysis of problems associated with role definition, functional responsibility, and delegation of authority. (15) Some of the problems cited by Kozuma and Dehner are evaluated in the following chapters as they appear in the present environment.

### Background

Current public interest, Congressional pressure and close scrutiny by various news media have magnified the requirement for optimum management of major weapon system acquisition programs. Congress has reduced the Department of Defense budget, and all indications show that additional reductions may be forthcoming. The continuing effort to "do more with less" requires more extensive application of a systems management approach. The following discussion relates several systems management concepts to the subject of DOD project management.

The tasks of the System Program Director (SPD) and the AFPRO Commander are extremely diversified and complicated. These individuals must tie together the efforts of the prime contractors and subcontractors to meet schedule and expenditure restraints. Also, they must coordinate and direct administrative and technical disciplines. The result of their efforts must be an organized acquisition team which acts as a unit rather than a fragmented group of functional entities.

The management of a complex project or program, such as the acquisition of major Department of Defense systems,

requires both horizontal and diagonal functional relationships in addition to the standard vertical hierarchy. In systems management, managers and technicians must be able to deal across functional organization lines with their associates and with personnel in other organizations.

To follow "the chain of command" would be unwieldy, time consuming, costly, and would disrupt and delay the work. In many cases, these relationships have sufficient strength and permanency to become defacto the modus operandi of the organization. (5:151)

The concept of systems/project management has received the attention of key management personnel during recent years. The following quotations describe the concept as viewed within the military and academic environments.

Systems/Project Management is defined by the DOD as:

A concept for the technical and business management of particular systems/projects based on the use of a designated, centralized management authority who is responsible for planning, directing, and controlling the definition, development, and production of a system/project; and for assuring that planning is accomplished by the organizations responsible for the complementary functions of logistic and maintenance support, personnel training operational testing, activation, or deployment. The centralized management authority is supported by functional organizations, which are responsible to the centralized management authority for the execution of specifically assigned project tasks. (38:2)

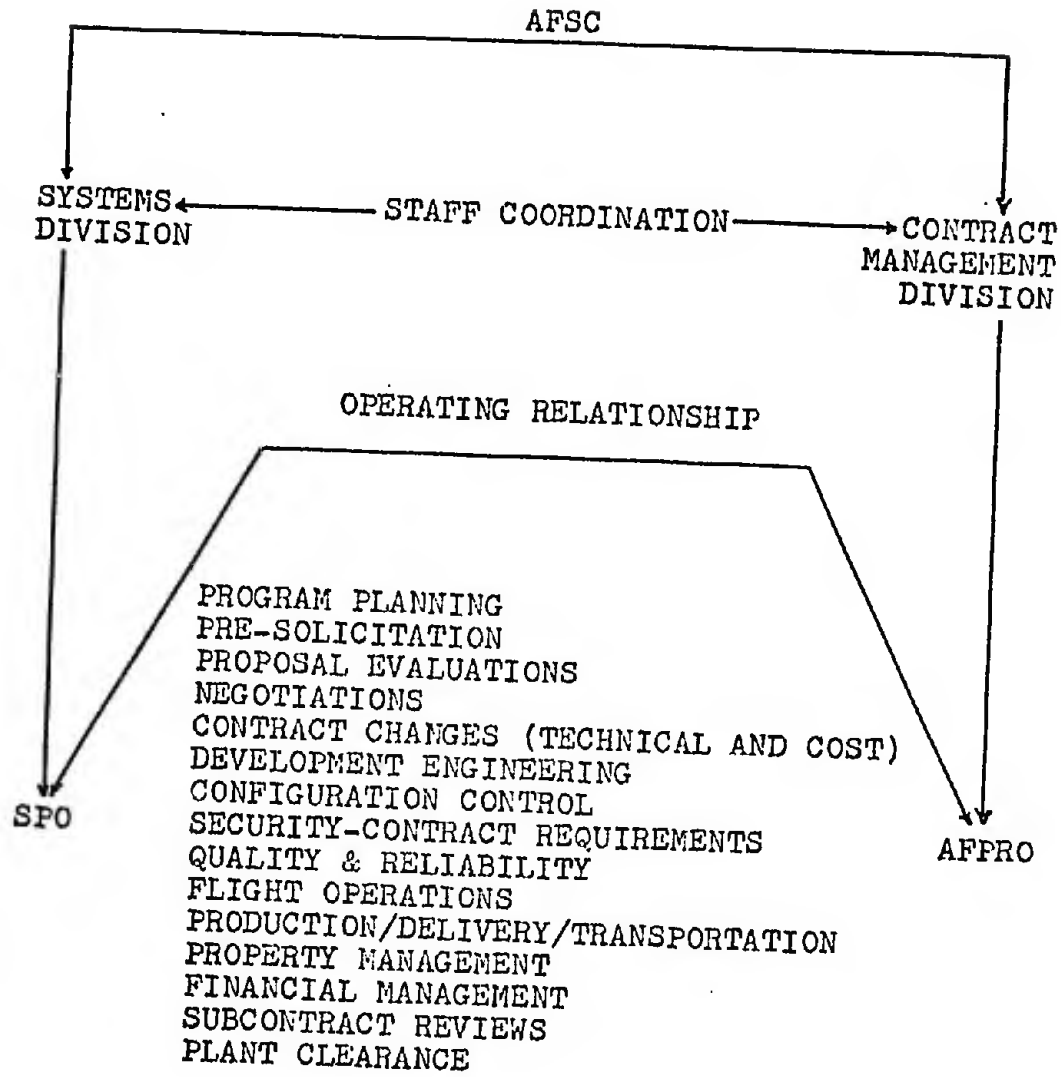
Johnson, Kast, and Rosenzweig describe the systems concept as:

The systems concept provides a framework for visualizing internal and external environmental factors as an integrated whole. It allows recognition of the function of subsystems, as well as the complex super-systems within which the manager must operate. The systems concept fosters a way of thinking which helps the manager to recognize the nature of complex problems and thereby helps to dissolve some of the complexity. (14:1)

There is a continuous meshing of policies, operating procedures, management philosophies, functional organizations and the active involvement of personnel during the life cycle of the defense system acquisition process. Successful programs are characterized by strong working relationships which are continuously supported by the close coordination of ideas from individuals in all areas of involvement. Every significant decision must be discussed and coordinated with applicable functional areas to insure rapid response and full support once it is implemented.

The majority of the problems associated with the functional interaction of a given SPO and AFPRO appear to involve more than one particular functional area. For example, a product performance problem might involve coordination of the Engineering, Production, and Quality Assurance Divisions. It is imperative that key management officials have a sound knowledge of the relative responsibility and purpose of the individual functions of the program. This thorough understanding of responsibilities promotes the resolution of interfunction conflict between the SPO and the AFPRO. A general overview of the SPO/AFPRO operating relationship is shown in Figure 1.1.

Organization is primarily an information and decision system. Information, ideas, and questions are continually oscillating between SPO and AFPRO functions as well as from other sources. This communication flow must be correctly perceived and transmitted, and the relevant or



AFPRO/SPO Relationship

Figure 1.1

Source: McDonnell Aircraft Company. The United States Air Force Weapon System Acquisition Process. June 1970, p. 8.

significant information must be separated from the insignificant and extraneous material. Once the information has been properly coordinated and organized, an effective decision must be formulated that will produce the desired results. Information systems are evident in all aspects of our environment, but those existing in system/project organizations are probably the most complex. (7:92)

Numerous attempts have been made to develop guidelines for the organization of a successful systems management approach to a complex and unique project environment. Cleland and King provide a list of key project organization requirements which are essential to the establishment of a framework which not only produces results, but also clarifies individual responsibilities:

1. Clear-cut requirements must be established to provide the framework of the objective.
2. The modus operandi should be established.
3. The human and non-human resources should be aligned to aid the overall operation.
4. Feedback techniques should be established such that the overall effectiveness of the operation can be sensed and, if necessary, modified to meet changing demands. (5:168)

The functional relationship between the SPO and the AFPRO is regarded as a continuum of tasks and responsibilities. There are responsibilities and functions unique to each organization and a middle region influenced by program factors. (37:7) This thesis will be directed to

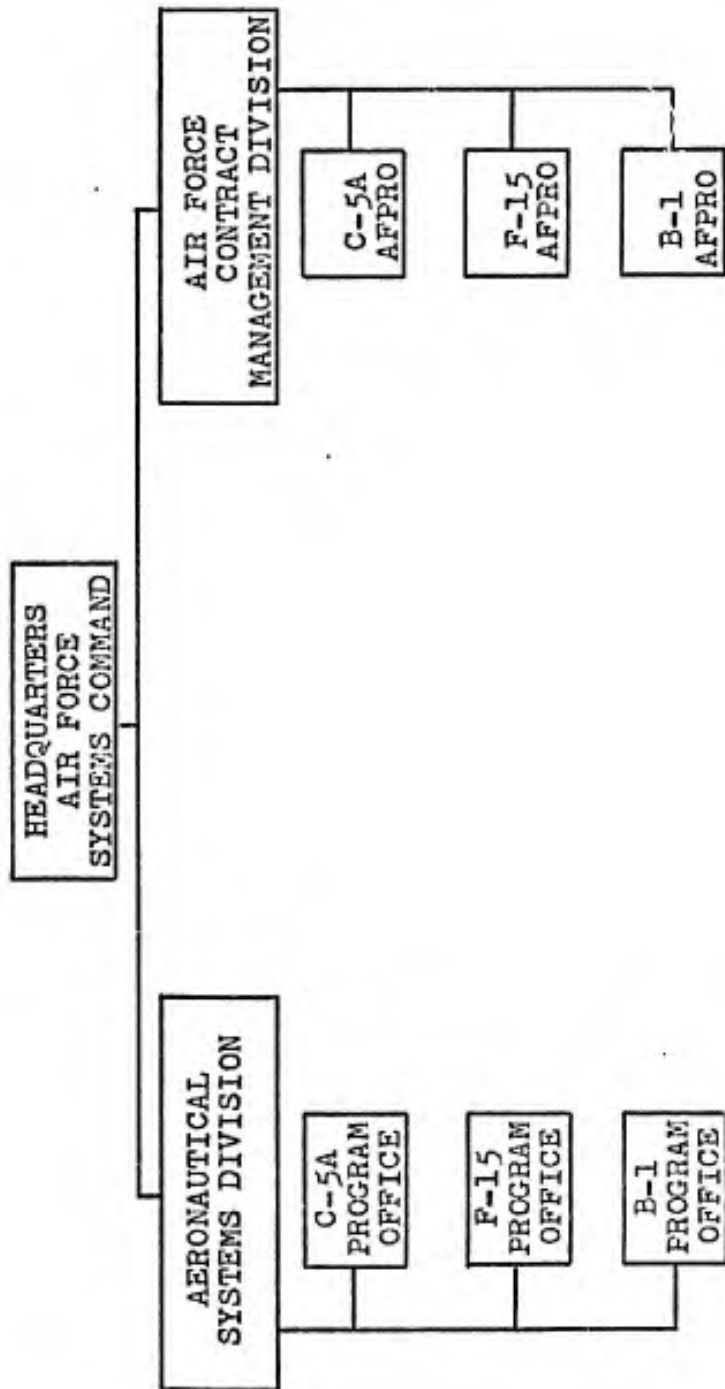
this middle region which incorporates the realm of functional SPO/AFPRO controversy.

Considerable effort is being made within the Department of Defense to provide adequate guidance toward improved defense system acquisition. The emphasis is on management, as expressed by General Schriever:

Many times we have found the pacing factor in acquiring new weapon, support, and command and control systems is not technology--it is management. All too often technology has been known, but it was not properly put to use because of shortcomings in our management ability. (47:FWD)

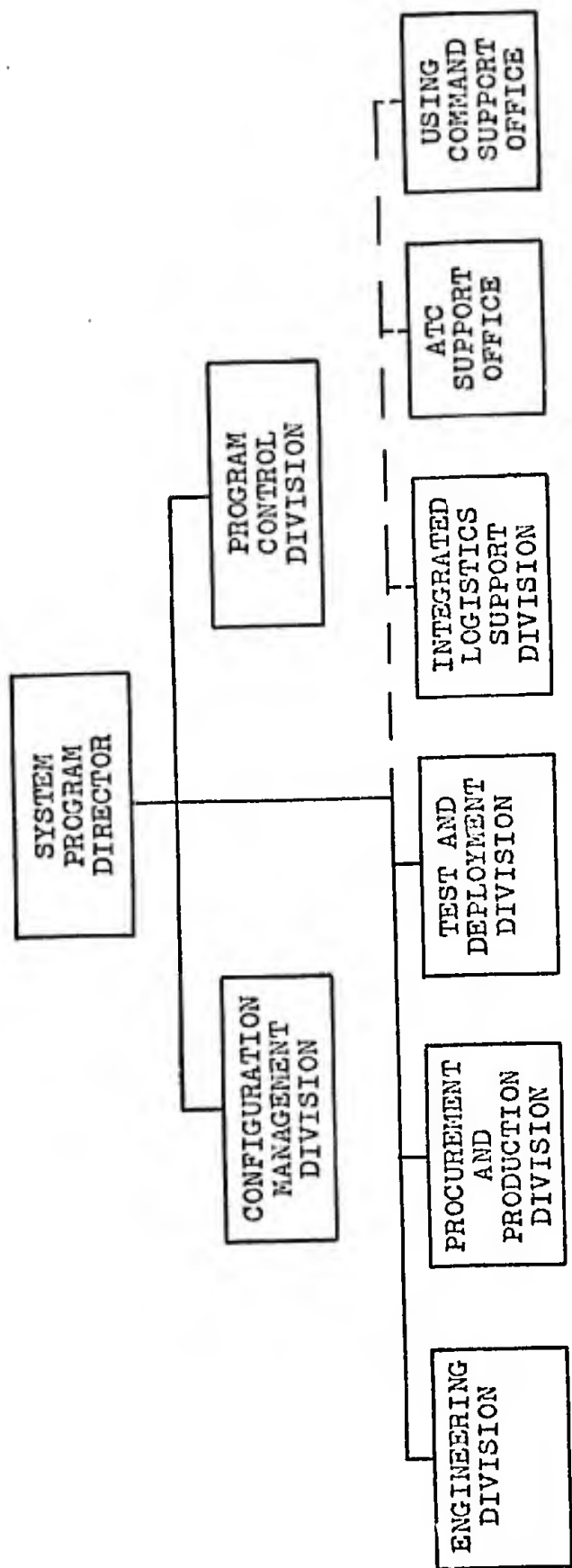
Figure 1.2 shows the organizational relationship of the SPO and the AFPRO within the AFSC chain of command. The formal and standardized organizational structure for SPO and AFPRO organizations is depicted in Figure 1.3 and Figure 1.4, respectively. However, some of the organizations studied in this research effort have deviated somewhat from these standards. The B-1 SPO has a projects division which places the responsibility for performance, cost and schedule attainment on individual system managers, e.g., engine, aerospace ground equipment, avionics, and armament. The AFPRO's have deviated from the standard in that they are projectized to increase the emphasis on contract management of major defense systems.

The functional areas of concern for this thesis are shown in Figure 1.5. The primary areas of SPO-AFPRO functional interaction are delineated by arrows. It should be noted that this is a broad and general picture and that sometimes personnel assigned to functions not related by



ASD/AFCMD Organizational Relationship

Figure 1.2

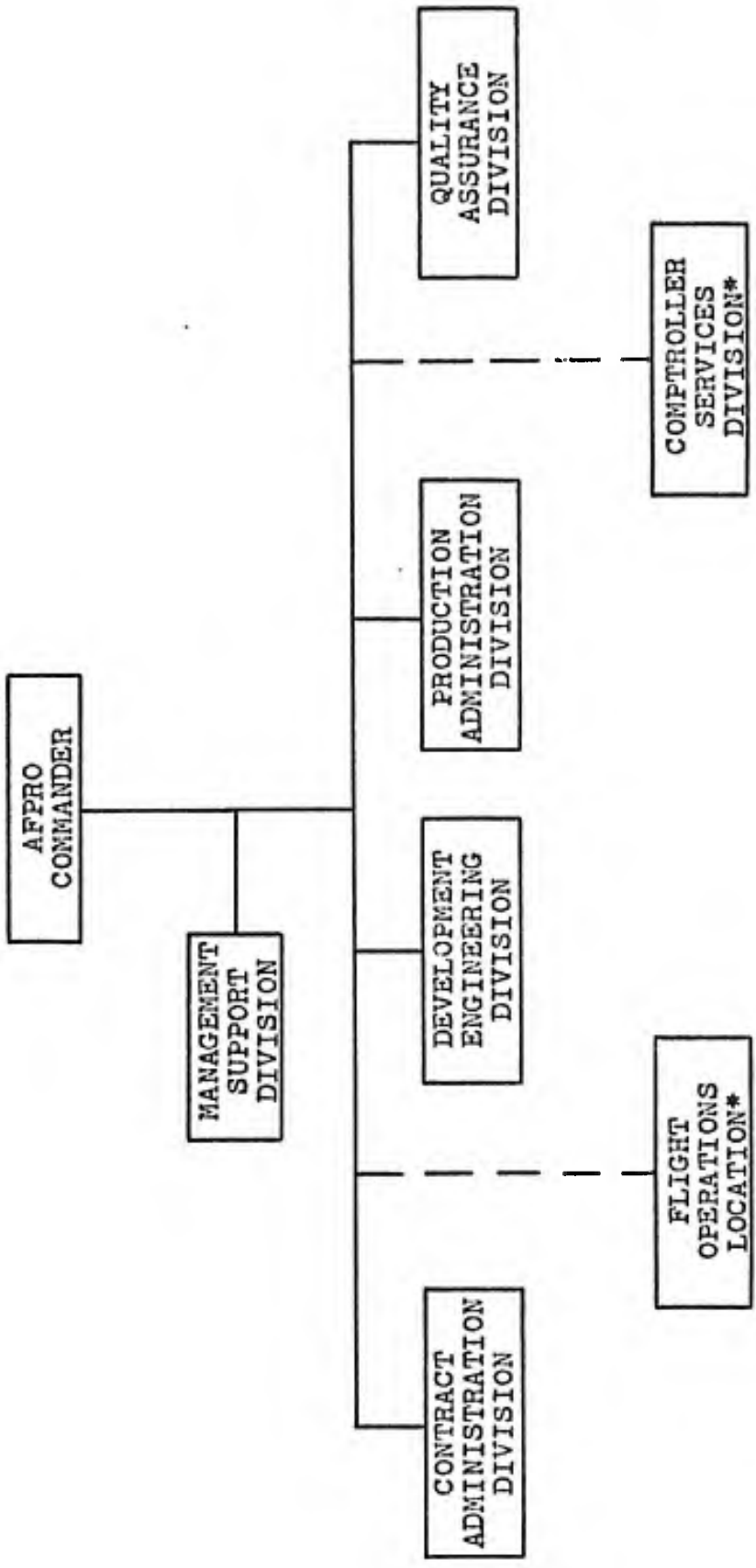


LEGEND: ----- Participating Agency

"Standardized" SPO Organizational Chart

Figure 1.3

Source: AFSCM 375-3, p. 9.



"Standardized" AFPRO Organizational Chart

Figure 1.4

\*Specific locations as required

Source: Organization and Functions Chart Book, Air Force Contract Management Division. RCS: 1-SYS-03, 1 February 1969, p. 16.

## SPO-AFPRO FUNCTIONAL RELATIONSHIP

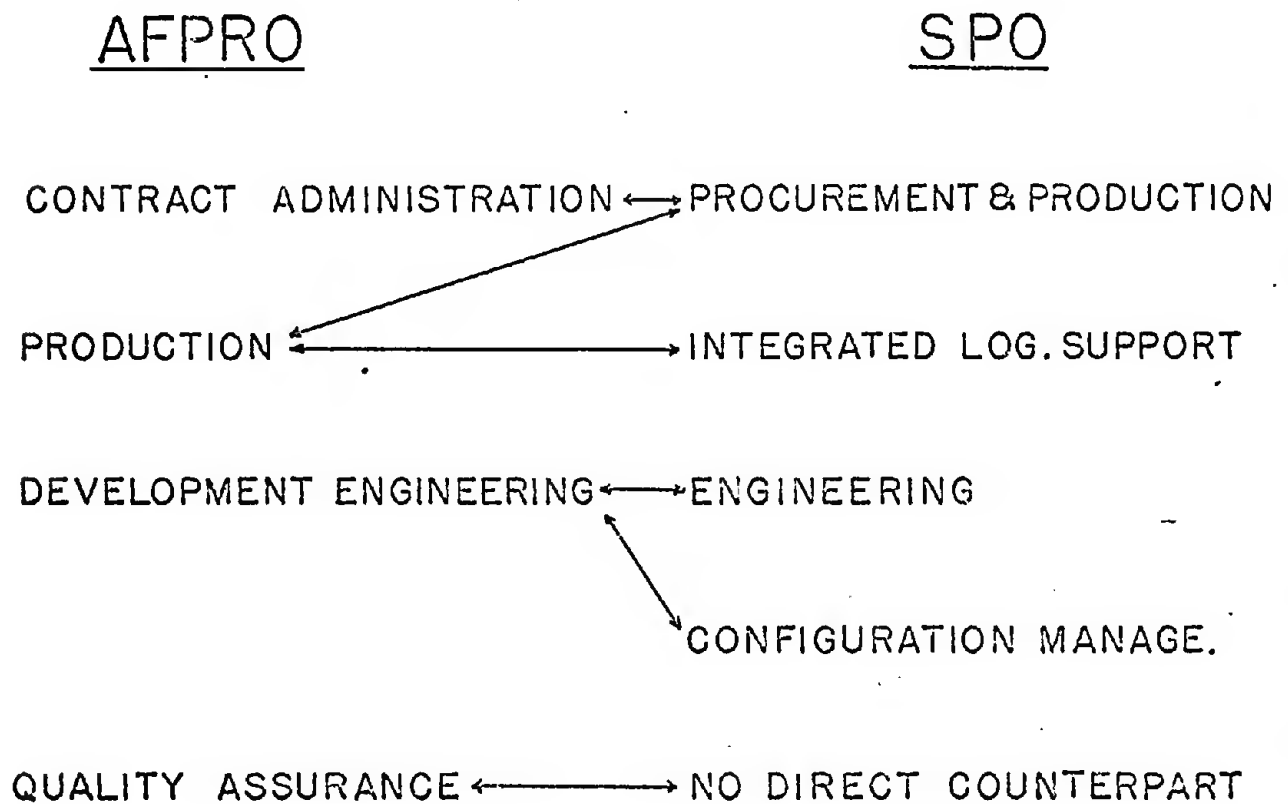


Figure 1.5

arrows, mutually respond to associated problems. A brief summary of the roles and responsibilities of these functional areas is provided in the following paragraphs.

The SPO Procurement and Production Division acts as the focal point for all contract negotiations. It manages and supervises the procurement program. The procuring contracting officer coordinates and approves all contractual changes through the administrative contracting officers at the AFPRO's.

The SPO Integrated Logistics Support Division is responsible for the logistics aspects of system requirements and contractor proposals. It provides for the support of maintenance, transportation and supply throughout the system life cycle. This section also participates in the evaluation of system supportability. It prepares the plans for system transfer to the using command and the Air Force Logistics Command upon the termination of the acquisition process.

The SPO Engineering Division provides technical support to the SPD. It is responsible for all engineering, systems analysis, and the integration of the system and associated AGE. It conducts trade-off studies to develop or validate design changes. It coordinates with the integrated logistics support division to evaluate system supportability.

The SPO Configuration Management Division is responsible for hardware configuration status and

specifications. This section identifies and controls all hardware and documentation changes.

The AFPRO Contract Administration Division is responsible for the assurance that the contractor has performed the contract provisions as specified. It approves contractor financial procedures and negotiates overhead rates, contract changes, spare parts requirements and contract terminations. The effective negotiation of overhead rates can be critically important to the cost success of a program. It also evaluates contractor proposals and operations with subcontractors.

The AFPRO Production Administration Division provides guidance and supervision to the contractor's functional production areas. It evaluates contractor proposals to determine the production capability of the contractor. It reviews production schedules, materials, facilities, production layouts, tooling requirements, and labor to determine if the contractual components will be economically produced and delivered on schedule.

The Development Engineering Division of the AFPRO is responsible for the surveillance of system effectiveness, contractor engineering management and test and evaluation procedures. It monitors engineering change proposals to determine their validity and feasibility. It provides engineering support to the SPO as specified in the SPO/AFPRO memorandum of agreement.

The AFPRO Quality Assurance Division is responsible for the physical inspection of contractor manufacturing

operations to determine if the contractually specified quality and reliability of all components is achieved. It designates deficient areas and reviews the contractor's corrective actions to eliminate discrepancies. It is also responsible for the review and evaluation of the contractor's safety program.

The dynamic management procedures developed and utilized within the major functional areas of SPO and AFPRO organizations must be compatible to their constantly changing environment. The intent and purpose of this thesis is to analyze current functional relationships and interactions between the SPO and AFPRO. Areas of merit have been acknowledged and recommendations made for the possible resolution of existing problems in the following chapters. It is hoped that the conclusions and recommendations will prove beneficial to both current and future SPO/AFPRO management.

### Scope

This thesis involves a comparative analysis of SPO and AFPRO centers of activity which have common functional objectives. An example is the relationship between the SPO Procurement and Production Division and the AFPRO Production Administration Division.

Three major SPO's and their respective AFPRO's were subjectively selected to provide the data base. The C-5A, F-15, and B-1 weapon system acquisition programs were chosen based on their current level of activity, different states

in the acquisition process and aircraft type. The authors assumed that the personnel assigned to these programs provided a representative data base for the analysis of the problems discussed in this thesis.

The study was limited to the C-5A, F-15, and B-1 programs. It was primarily restricted to the following functions: (1) Contract Administration, (2) Production, (3) Engineering, (4) Configuration Management, and (5) Quality Assurance.

### Objectives

It was the objective of this thesis to examine the functional relationship between three major System Program Offices and their corresponding Air Force Plant Representative Offices. The specific objectives were as follows:

1. Determine the existing degree of definition for the SPO-AFPRO functional relationship.
2. Determine how assigned personnel view current organization and management procedures.
3. Determine the adequacy of current formal and informal communication channels within major defense system acquisition programs.
4. Identify significant management practices and/or problems in the area of SPO-AFPRO functional relationships that might enhance the acquisition of future defense systems.
5. Provide recommendations for the possible resolution of identifiable problem areas.

### Research Questions

The following research questions were used to guide the research toward accomplishing the above objectives:

1. Is the existing SPO-AFPRO functional relationship sufficiently defined for successful operations within the constraints of the current operational environment?
2. How do assigned personnel perceive the adequacy of current organizational and functional alignment?
3. Do existing SPO and AFPRO communication channels adequately support program objectives?
4. Do significant management practices or organizational problems exist which warrant consideration in the establishment of future SPO-AFPRO organizations?

### Organization

The thesis is divided into four chapters:

Chapter 1 describes the study, discusses the purpose and importance of the research, describes the problem, discusses related research, provides a background on the environment of acquisition management, describes the scope of the study, outlines research objectives and questions, and outlines the organization of the thesis.

Chapter 2 discusses the nature and sources of data, describes the questionnaire, describes the data collection techniques and describes the analytical approaches which were used in the research effort.

Chapter 3 presents a question-by-question statistical analysis of questionnaire data followed by substantiating

comments for positive and negative question response.

Chapter 4 presents the overall findings and recommendations, describes the current SPO-APPRO functional environment as perceived by assigned personnel, proposes areas for further research, and summarizes the overall research effort.

## Chapter 2

### RESEARCH AND ANALYSIS PROCEDURES

The previous chapter outlined the nature of the research effort and its objectives. This chapter addresses the data that was collected, the data sources, and how the analysis results will be presented to the reader. The nature and sources of information to be discussed will include published material, personal interviews, and a mailed questionnaire. The structure of the questionnaire will be discussed. Data collection techniques will be outlined for primary and secondary data. Finally, the methods of data analysis and presentation will conclude this chapter.

#### Nature and Sources of Data

A general knowledge of the acquisition process and a more thorough understanding of the environment surrounding the realm of SPO-AFPRO interaction was an essential prerequisite to this study. The research effort began with an investigation of the background, development, purpose and objectives of SPO and AFPRO management with special concern for areas of mutual responsibilities. Available publications, manuals, regulations, reports and prior research studies, relevant to the functional interaction between the SPO and AFPRO were examined. Interviews were conducted

with AFPRO and SPO personnel to further refine the nature of the problem.

With this background, the authors developed a questionnaire which became the primary source of data. The questionnaire provided data which was used to answer all four research questions. The SPO-AFPRO functional relationship was, therefore, analyzed with reference to how currently assigned personnel perceive relevant areas of interaction.

Two thesis efforts provided a major impetus to this research. "The Role of the Air Force Plant Representative in the Weapon System Acquisition Process," by Lieutenant Colonel Roger T. Kozuma and Captain Frederick T. Dehner, provided a great deal of insight into the general SPO-AFPRO operational environment. Captain Robert L. Holland's thesis, "Role Definition in the Decision-Making Process of Weapon Systems Acquisition," aided in the generation of the questionnaire and the process of narrowing the topic area to meaningful and researchable proportions.

#### Presentation of the Questionnaire

Two separate questionnaires were developed with closely related questions. One questionnaire was designed for SPO use and the other for the AFPRO. The only difference was the wording of the questions which facilitated their alignment with a SPO or an AFPRO working environment. During the pretest of the questionnaire, the authors discovered that any attempt to construct one combined questionnaire reduced the strength and usefulness of the final data. The

dual questionnaire procedure eliminated biased appearing questions and was evidence to the respondent that his viewpoint would be given singular analysis.

Samples of the actual questionnaires which were mailed to SPO and AFPRO personnel are contained in Appendices A and B respectively. One hundred of the one hundred and forty questionnaires mailed were returned for a return rate of 71.4 per cent. The individual organization returns are provided in Appendix C. It is the authors' belief that the unusual volume of narrative provided by questionnaire respondents is attributable to the dual questionnaire approach. A majority of the respondents substantiated their "yes" or "no" position with factual and experience-related commentary. The comment portion of the questionnaire greatly enhanced the final analysis of the data as will be evidenced in Chapter 3.

#### Data Collection Techniques

The attached questionnaires, in conjunction with selected interviews, were the principle sources of data. The questionnaires were the primary data gathering instruments. The interviews exposed the authors to a wide range of spontaneous commentary regarding the SPO-AFPRO relationship. Interviews with selected SPO and AFPRO personnel provided detail which complemented and enhanced the data obtained via the questionnaire. The distant location of the AFPRO's limited the number of interviews which could be conducted, but at least one person was interviewed from each

of the applicable organizations. Although travel time was limited, trips were made to Air Force Systems Command Headquarters, Washington, D.C.; Detachment 28 AFPRO, Evendale, Ohio; and the McDonnell Douglas Plant, St. Louis, Missouri.

Each questionnaire contained twenty questions which required a scalar response. A five-digit scale was designed using the integers one through five. The respondent indicated his position on a given question by circling one of the five possible choices. A "yes" response was indicated by the integer 1, with the number 3 being "uncertain" and number 5 indicating a "no" response. Following his selected answer, the respondent was asked to further qualify his response by providing additional comments. The narrative responses made to the questionnaire enabled the authors to gain some insight into the opinions of experienced personnel with regard to their area of functional responsibility. The respondents were asked to relate their answers to the working relationship experienced with their respective SPO or AFPRO.

The comment section, following each question, was relied upon to provide data which could not be drawn from a simple programmed response questionnaire. In addition to the commentary on each question, the respondent was requested to indicate additional information at the end of the questionnaire, which he felt was relevant to the study. The wide dispersion of the AFPRO's and the tight schedules of key SPO and AFPRO personnel narrowed the possibilities

for extensive interviews. The commentary received on the questionnaires more than filled this interview gap.

The distribution of questionnaires was determined with the use of a random number table. Current organizational charts were obtained from each organization. The authors consecutively numbered each individual listed on the charts. The questionnaires were mailed to SPO/AFPRO military and civilian personnel as selected from a random number table using a two-digit column. (29:621-625)

The total number of questionnaires sent to a given SPO or AFPRO was subjectively set at 25 and 20 respectively. This subjective limit was based on the total number of managerial personnel assigned to each organization. The variance in the AFPRO totals is attributed to the authors' personal visit to the F-15 AFPRO and an extensive workload at the C-5A AFPRO during the data collection period.

#### Data Analysis Procedures

A statistical analysis of each question was made using nonparametric statistical analysis techniques appropriate for small samples with unknown population parameters. The two specific tests used were the binomial test and the Fisher exact test.

The specific numeric responses to individual questions are provided in Appendices D, E, and F. This original data was dichotomized into "yes" and "no" categories as shown in Tables 2.1 and 2.2. The original numeric responses of 1 and 2 were grouped into a "yes" category and numeric

Table 2.1  
SPO Response Data\*

Question	C-5A		F-15		B-1	
	Yes	No	Yes	No	Yes	No
1	7	10	4	12	12	1
2	11	6	14	3	11	3
3	12	2	13	1	11	1
4	5	8	5	10	5	7
5	5	10	11	5	9	2
6	10	1	7	6	9	1
7	10	2	11	4	8	4
8	7	4	12	2	4	3
9	10	5	15	1	10	1
10	8	7	16	1	10	2
11	12	4	15	2	9	2
12	7	7	14	0	8	2
13	4	12	3	13	6	8
14	3	10	3	11	2	10
15	3	11	3	8	0	11
16	7	2	12	2	10	0
17	9	3	2	10	7	5
18	9	4	10	3	6	3
19	9	1	8	2	11	0
20	17	0	17	0	11	3

\*Dichotomized into yes/no responses to facilitate statistical analysis.

Table 2.2  
AFPRO Response Data\*

Question	C-5A		F-15		B-1	
	Yes	No	Yes	No	Yes	No
1	6	6	7	18	5	5
2	10	2	19	4	9	3
3	8	1	19	4	7	1
4	8	3	7	9	8	2
5	7	5	11	9	10	2
6	9	4	15	4	8	2
7	10	1	17	4	8	4
8	9	0	11	2	3	3
9	11	2	16	4	11	2
10	12	1	15	8	11	1
11	10	3	13	7	7	5
12	10	1	17	4	7	2
13	5	5	3	20	1	12
14	2	10	11	11	3	8
15	0	11	6	15	0	13
16	9	0	17	2	10	1
17	6	3	10	9	5	3
18	4	3	17	1	9	3
19	12	0	11	3	9	0
20	12	0	20	1	12	0

\*Dichotomized into yes/no responses to facilitate statistical analysis.

responses 4 and 5 were grouped into a "no" category. The uncertain numeric response of 3 was dropped from the useable data.

The nonparametric binomial test was used for each question to either accept or reject the null hypothesis that there is no difference in responses to the question. In other words, the null hypothesis states that the proportion of "yes" responses is equal to the proportion of "no" responses. The alternate hypothesis states that there is a significant difference between the "yes" and "no" response patterns at the stated level of significance.

Once the data was dichotomized into two discrete categories, the two-tailed Fisher exact test was used to determine the significance of differences between the expected responses under the null hypothesis and the actual responses made by SPO and AFPRO personnel. The objective of this analysis was to determine if there was any relationship between the way the SPO responded to a given question and the way its counterpart AFPRO responded. The null hypothesis used for the Fisher exact test was that there is no significant difference between the SPO and AFPRO response patterns.

Each question was tested at both the .10 and the .05 level of significance. The level of significance is the probability, if the null hypothesis is true, of mistakenly or falsely rejecting the null hypothesis. (31:9) The use of a .05 significance level indicates that test results which

are equal to or less than this value would occur five per cent or less of the time due to chance alone, if the null hypothesis is correct. Thus, the null hypothesis is rejected if the calculated test value does not exceed the established significance level.

### Binomial Statistical Analysis

The dichotomized data lends itself to the application of the binomial test, because this data falls into two discrete categories (yes or no). For any two classes of data, the proportion of cases in one category will be  $P$  and the proportion in the other category will be  $1-P$ . The value of  $P$  will be fixed for any population, but will vary from sample to sample and from population to population. The binomial distribution will give the various values that might be observed in random samples taken from a population having two discrete classes. It will indicate whether or not it is reasonable to believe that the observed sample values could have been drawn from a population having a specified proportion of  $P$ . (31:36-37) As indicated by the null hypothesis, a population parameter ( $P$ ) of .50 was used in the binomial tests.

The probability of obtaining the observed value or values even more extreme was found through the use of the cumulative probability tables in Probability and Statistics. (23:380-388)

The alternative or research hypothesis was that the two categories of responses would differ. That is, the

number of "yes" responses would be significantly different from the number of "no" responses for a given question.

Fisher Exact Statistical Analysis

The Fisher exact test was used to determine the significance of differences in response patterns between the SPO and AFPRO for a given defense system. The data was placed in a 2 X 2 contingency table as follows:

	YES	NO	
SPO	A	B	A + B
AFPRO	C	D	C + D
TOTAL	A + C	B + D	

The null hypothesis was that there is no significant difference between the response pattern of SPO personnel and AFPRO personnel.

The exact probability of the observed occurrence was determined by taking the ratio of the factorial products of the four marginal contingency table totals to the product of the cell frequencies multiplied by N factorial: (31:96-97)

$$P = \frac{(A + B)!(C + D)!(A + C)!(B + D)!}{N! A! B! C! D!}$$

The authors considered the more extreme deviations when no contingency cell frequencies were equal to zero and the probability of the observed values was less than .10. This was accomplished by summing the probability of the observed situation with the probability of the more extreme

occurrence(s). For example, if the smallest cell entry was three, the exact probability was computed and summed for the four possible extremes.

The authors developed a FORTRAN computer program to minimize the tedious computations involved in using the hypergeometric formula discussed above. This also enhanced the summation process to determine the probabilities of more extreme situations for applicable questions. The hypergeometric probability tables found in the Lieberman and Owen text were used to validate the computer program. (18)

The .10 and .05 significance levels were employed for the Fisher exact test as described for the binomial test.

The detailed computations were omitted from the thesis, however, the final figures are provided in the appropriate tables found in Chapter 3.

Each question is subjected to a detailed analysis in Chapter 3. First, the question is stated. Second, the dichotomized data and the results of the statistical tests are presented in a table. Third, the rationale behind the question and its implications are explained. Finally, comments are made concerning the pro and con narrative received on the questionnaires.

### Summary

This chapter has described and discussed the research and analysis procedures used throughout the thesis. Primary data was obtained via the questionnaires and was

supplemented with secondary data from publications and selected interviews. The purpose for the dual questionnaire was basically an attempt to minimize organizational bias. The data collection process was described with reference to selected interviews and randomly distributed questionnaires. Data analysis was accomplished using the binomial and Fisher exact tests. A brief description was given for each of the tests and their application to this study was discussed. Chapter 3 will present an in-depth analysis of each of the twenty questions and how SPO and AFPRO personnel responded to them.

## Chapter 3

### ANALYSIS OF QUESTIONNAIRE RESPONSES

This chapter of the thesis contains a detailed statistical analysis of the research questionnaire. Chapter 2 provided an introduction to the questionnaire and a discussion of its design and application. Also contained in Chapter 2 was an in-depth description of the two statistical tests which were applied to the response data. The binomial test provided an indication of the significance of a given "yes" or "no" response made by a SPO or an AFPRO organization. The Fisher test was employed to indicate the significance of the variability between the response patterns of the SPO as compared to the associated AFPRO.

The reader will recall that a null hypothesis was developed for each of the statistical tests. Both null hypotheses are restated below for future reference.

#### Binomial Test Null Hypothesis

There is no significant difference between the number of "yes" responses and the number of "no" responses made by a specific SPO or AFPRO to a given question.

#### Fisher Test Null Hypothesis

There is no significant difference between the response pattern generated by SPO personnel as compared to the response pattern of AFPRO personnel.

The .10 and .05 levels of significance were employed in the analysis of the questionnaire responses. A rejection of the null hypothesis, at a given significance level, provides an indication that a statistically significant response group or response pattern is identifiable. A rejection of the binomial null hypothesis indicates that the number of "yes" responses significantly overrides the number of "no" responses or vice versa. A rejection of the Fisher null hypothesis indicates that a significant difference exists between the response pattern of the AFPRO. In short, the binomial test was applied to the intraorganizational aspect whereas the Fisher test was applied to the interorganizational aspect.

The balance of this chapter flows from an analysis of question number one through question number twenty of the research questionnaire. In an attempt to maximize the readability of this portion of the research, a common framework was utilized in the narrative analysis of each question. This narrative framework is outlined below:

1. Statement of the question to be analyzed
2. Presentation of a table depicting:
  - a. Defense System (SYSTEM)--C-5A, F-15, and B-1
  - b. Organization (ORGN)--SPO and AFPRO
  - c. Useable Responses (RESP)--total useable  
"yes" and "no" responses by an organization
  - d. Total "yes" responses by an organization
  - e. Total "no" responses by an organization

- f. Binomial test results (BINOMIAL)--by organization
  - g. Fisher test results (FISHER)--by weapon system
3. General rationale upon which the question was based
  4. Discussion of the response made by each organization
  5. Specific comments made by individuals concerning the topic area of the question

Question 1: Do you feel that the establishment of a SPO detachment, co-located with the AFPRO, would (does) benefit your program?

Co-location of SPO Detachment with AFPRO

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	17	7	10	.315	.265
	AFPRO	12	6	6	.613	
F-15	SPO	15	3	12	.018	.258
	AFPRO	25	7	18	.022	
B-1	SPO	13	12	1	.002	.040
	AFPRO	10	5	5	.623	

Table 3.1

The B-1 and F-15 acquisition programs have deviated somewhat from the normal organizational structure by physically placing SPO assigned personnel within the AFPRO working environment. The B-1 program represents a more

radical approach to this organizational arrangement. The B-1 Program Director has established a small scale SPO contingent at the North American Rockwell Plant in Los Angeles. The F-15 SPO has placed a logistics cadre at the McDonnell Douglas AFPRO in St. Louis.

This first question was devised to find out the degree of acceptability that the co-location principle was receiving. The question was aimed at an appraisal of the B-1 arrangement as opposed to the F-15 single function co-location. Even though personnel assigned to the C-5A program had no experience with SPO co-location, their comments on the question indicated that they had formulated rather firm opinions on the subject.

The C-5A respondents indicated no significant preference for or against the co-location concept. Table 3.1 demonstrates this divided opinion by showing only a slightly negative trend among the C-5A SPO respondents and a tie between positive and negative AFPRO response totals. The Fisher statistic indicates that the response patterns of the C-5A SPO and the AFPRO cannot be significantly differentiated.

The F-15 program, as stated earlier, has a small degree of co-location represented in the organization. However, when questioned on the aspect of across-the-board functional co-location, both the SPO and the AFPRO rendered a negative preference which was significant at the .10 significance level. The Fisher test result followed from

this common negative preference by indicating no significant difference in the response pattern.

The B-1 might be considered as an initial proving ground for the future of the SPO co-location concept. Responses from managers actually exposed to this organizational approach must be considered as being more critical than those rendered by F-15 or C-5A personnel. The B-1 SPO respondents indicated a positive attitude toward co-location. Their preference for a "yes" response was found to be significant at the .05 level of significance.

The B-1 AFPRO respondents displayed an indifferent attitude toward co-location. Of the ten useable responses made by B-1 AFPRO personnel, five "yes" and five "no" responses were generated. The Fisher exact test indicated that an area of disagreement exists in this subject area. At the .10 level of significance, the null hypothesis can be rejected indicating a significant difference between the response pattern of the B-1 SPO as compared with the AFPRO.

Comments made in favor of co-locating SPO assigned personnel with AFPRO personnel included:

1. Due to the critical nature of acquisition programs, the use of on-site SPO engineers is helpful.
2. Co-location provides quick access to everyday problems, eliminates correspondence time, and overcomes differences in time zones.
3. The Program Director never would have made full use of the AFPRO personnel.

Comments made against the co-location aspect were:

1. It drives a wedge between the SPO and the AFPRO. The Air Force should present one face to the contractor at the plant location.

2. It tends to develop a duplication of effort which costs time as well as money.

3. This arrangement defeats the purpose of the AFPRO's existence.

4. Co-located SPO personnel merely add another organization to the chain.

More data would have to be collected to substantiate the B-1 SPO-AFPRO disagreements. However, the fact remains that the B-1 SPO, originator of the co-location principle, was the only organization which statistically preferred the arrangement.

In general, the commentary which favored co-location identified increased SPO awareness as a focal issue. Respondents that opposed the placement of SPO personnel within the AFPRO operational environment directed their comments toward duplication of effort.

Question 2: Do you have a designated counterpart in the SPO (AFPRO)?

Designation of Functional Counterparts

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	17	11	6	.166	.190
	AFPRO	12	10	2	.019	
F-15	SPO	17	14	3	.006	.323
	AFPRO	23	19	4	.001	
B-1	SPO	14	11	3	.029	.347
	AFPRO	12	9	3	.073	

Table 3.2

Preliminary interviews gave some indication that minor communication barriers existed which hindered SPO-AFPRO interaction. Several individuals assigned to various acquisition programs indicated that the lack of a functional counterpart within the SPO or the AFPRO hindered communication flow, problem resolution, and overall effectiveness. These preliminary interview comments led to the formulation of Question 2.

As Table 3.2 indicates, the questionnaire responses did not substantiate the preliminary interview comments. All the responding organizations displayed a positive reaction to the question and a comparative response pattern. Only the C-5A SPO and B-1 AFPRO failed to render statistically significant "yes" response groups at the .10 significance level.

General commentary made in reference to this question pointed to the fact that the lack of a counterpart resulted, in most cases, from organizational structure. In other words, certain technical functions are unique to the SPO or the AFPRO environment and are not found in both organizations. The majority of the individuals who gave a "yes" response rendered comments on the enhancement of effectiveness which followed from the designation of a specified counterpart.

Several individuals followed a positive response with a comment referencing the lack of a specific counterpart but the existence of highly qualified and effective informal contacts. This aspect of interorganizational communication will be discussed in the analysis of Question 9.

Question 3: Do you feel that your functional counterpart in the SPO (AFPRO) has a sufficient understanding of your mission and responsibilities?

#### Mutual Understanding of Responsibilities

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	14	12	2	.007	.462
	AFPRO	9	8	1	.020	
F-15	SPO	14	13	1	.001	.284
	AFPRO	23	19	4	.001	
B-1	SPO	12	11	1	.003	.505
	AFPRO	8	7	1	.035	

Table 3.3

Once the existence or non-existence of a functional counterpart was established, the effectiveness of the counterpart relationship was probed by Questions 3 and 4. It was assumed that a good working relationship could not exist if both parties did not maintain an awareness of their counterpart's mission and responsibilities. A definite communication gap could evolve if this mutual awareness was absent.

As was the case with Question 2, respondents rendered a positive response pattern to Question 3. The preceding analysis showed that the majority of the managers responding to the questionnaire had established functional counterparts. Analysis of Question 3 revealed that the common awareness of counterpart responsibilities had also been established. Four of the six organizations showed "yes" response patterns which were significant at the .05 significance level. The remaining two organizations, the B-1 AFPRO and C-5A AFPRO, showed a "yes" preference significant at the .10 significance level.

It was interesting to note the commentary which followed several of the "yes" responses. The comments, as shown below, served to qualify the response:

1. My counterpart has sufficient understanding of my mission but when mutual problem solving is required he seems to dwell on minute details rather than providing general guidance.

2. Due to the level of understanding my counterpart

possesses, I anticipate timely action on problems. However, it appears that some problems are not given the proper priority.

In general, respondents followed a "yes" response with highly favorable comments such as:

1. We insure our mutual understanding through frequent meetings and correspondence.
2. Due to his experience in both the SPO and the AFPRO, our relationship is excellent.
3. Continual orientation meetings keep us both up to date.

It appears from the response pattern generated by Question 2 and Question 3, that the counterpart relationship is on firm ground. Question 4 will investigate a somewhat more controversial topic, direct interaction between the SPO and the contractor.

Question 4: Does (should) the SPO coordinate all applicable proposals and decisions with the AFPRO prior to implementation?

Coordination of Proposals and Decisions

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	13	5	8	.291	.104
	AFPRO	11	8	3	.113	
F-15	SPO	15	5	10	.151	.243
	AFPRO	16	7	9	.402	
B-1	SPO	12	5	7	.387	.0819
	AFPRO	10	8	2	.055	

Table 3.4

The implication of Question 4 was to establish the SPO and the AFPRO viewpoint with regard to the relative importance of the AFPRO in the SPO-AFPRO-Contractor chain. The question followed from those which were aimed at functional counterpart existence and awareness by going one step further. The authors' intent was to ascertain the degree of importance allotted to the timeliness of AFPRO program awareness. In other words, should the AFPRO continually be aware of and involved in future planning and decision making?

The C-5A and the B-1 SPO personnel displayed similar response patterns to this question. Although no statistically significant response groups were isolated, both AFPRO organizations favored a "yes" response. This indicated that

the majority of the AFPRO personnel feel that the SPO should not be required to coordinate all decisions with the AFPRO. It should be noted that further sampling would be required to substantiate these statements.

The F-15 SPO followed the same pattern as displayed by the C-5A and B-1. Once again, although not statistically significant, the majority made a negative response. Personnel in the F-15 AFPRO also gave a negative response. The general interpretation, in this case, is that the SPO respondents feel the coordination of all decisions is not required, while the AFPRO respondents contend that SPO personnel do not coordinate all proposals. Once again, further sampling would be required to substantiate this statement.

SPO personnel opposed to the coordination of all decisions with the AFPRO listed comments similar to the following:

1. Routine business does not require AFPRO involvement.
2. There are times when it is both impractical and time consuming.
3. Timing of decisions is often too critical to involve the AFPRO.

Several comments were also made in favor of AFPRO involvement in all decisions. These comments were rendered by both SPO and AFPRO respondents. However, two respondents,

both assigned to SPO organizations, provided comments which the authors feel demonstrate a real systematic approach to the situation. These respondents stated:

1. I could not possibly clear every detailed decision with the AFPRO, however, I believe that all correspondence which finalizes any decision or proposal should be routed through the AFPRO. This insures his familiarity with the action.

2. The AFPRO should be contacted in all cases. However, if the situation dictates direct contact with the contractor, a follow-up call should be made to the AFPRO to close the information loop.

In light of the narrative analysis which has been presented concerning Questions 2, 3, and 4, the reader should be in a position to draw his own conclusions with regard to functional counterpart interaction. The authors provided their conclusions on this subject in Chapter 4. At this point, it should be noted that the response patterns differed somewhat from the preliminary assumptions.

Question 5: Do you feel that the rotation of personnel between the SPO and the AFPRO would benefit the acquisition process?

Rotation of Personnel

SYSTEM	ORG..	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	15	5	10	.151	.137
	AFPRO	12	7	5	.387	
F-15	SPO	16	11	5	.105	.193
	AFPRO	20	11	9	.412	
B-1	SPO	11	9	2	.033	.409
	AFPRO	12	10	2	.019	

Table 3.5

When two organizations must combine their efforts and strive for a common goal, communication and mutual understanding must become prime concerns of management. This fact, of course, is everpresent in weapon system acquisition management. The geographically separated SPO and AFPRO must continually seek methods of closing the information loop in an effort to enhance the attainment of program objectives. One possible method is to rotate personnel between the SPO and the AFPRO thereby exposing them to both environments and increasing their understanding of each organization's operations.

It would be difficult to apply this rotation principle to top-level managers and it would be foolish to consider any non-management personnel for rotation. However,

the middle managers could feasibly be rotated without upsetting program continuity. In fact, personnel have been rotated, in this manner, in the C-5A program. Due to the fact that the C-5A program has been in existence for a longer period, sufficient time had elapsed for rotation to take place.

Question 5 asked the SPO and the AFPRO managers what their opinion was with regard to the rotation of personnel. As Table 3.5 indicates, only the C-5A SPO respondents did not favor rotation. The remaining five organizations displayed a positive attitude toward rotation. The B-1 SPO and AFPRO both displayed "yes" response groups which were significant at the .10 significance level.

It should be noted that many of the respondents could be exposed to rotation between SPO and the AFPRO. Their opinions were obviously affected by this factor. Personal considerations such as re-locating a household, may have outweighed program visibility when the individual was confronted with this problem. This fact is evidenced in the comment of one top-level manager who stated that military personnel could be easily shifted, but civilian rotation presented a more extensive task.

Respondents in favor of personnel rotation indicated:

1. Many SPO personnel do not have a complete knowledge of the AFPRO's function.

2. Most SPO personnel are new to SPO work whereas most AFPRO people are one contractor oriented. Both organizations would benefit from rotation.

3. Better understanding of coordinate functions would be the obvious benefit.

Individuals against rotation stated:

1. Frequent visits during the individual's assignment coupled with a good orientation program is a better idea.

2. Some jobs are unique to the SPO or the AFPRO and must not be considered for rotation.

3. Retraining of rotated personnel greatly hinders program continuity.

As stated earlier, both the B-1 SPO and AFPRO rendered statistically significant positive responses. Commentary made by B-1 personnel pointed out the fact that several individuals with SPO experience were assigned to the AFPRO at the outset of the program. These respondents further stated that the SPO-experienced individuals greatly enhanced communication and effectiveness.

The majority of the respondents that favored personnel rotation qualified their response with a statement regarding assignment length. They indicated that they favored rotation only if the minimum time spent in one assignment was two or three years.

It appears that the subject of personnel shifts requires further evaluation. If carefully studied, a

finalized personnel management policy could be devised which took advantage of the benefits of rotation.

Question 6: Should there be more AFPRO involvement in the validation phase?

AFPRO Involvement in the Validation Phase

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	11	10	1	.006	.185
	AFPRO	13	9	4	.133	
F-15	SPO	13	7	6	.500	.103
	AFPRO	19	15	4	.010	
B-1	SPO	10	9	1	.011	.395
	AFPRO	10	8	2	.055	

Table 3.6

Comments were made on this question which indicated some confusion existed with regard to the meaning of the term validation phase. The identification of different phases of an acquisition program has evolved to the current five-phase status. The five phases include: (1) the conceptual phase, (2) the validation phase, (3) the full-scale development phase, (4) the production phase, and (5) the deployment phase. During the conceptual phase the initial manning of the SPO takes place. This usually involves the formulation of a SPO cadre. The SPO cadre becomes involved in the source selection process and the evolution of the weapon system design. Several contractors may still be

competing for the final contract during the validation phase.

The implication of Question 6 was an attempt to find out whether the inclusion of the AFPRO in the validation phase activities could enhance the future effectiveness of the program. As Table 3.6 indicates, all response groups displayed a positive preference. Four of the six organizations displayed a "yes" response group which was significant at the .10 significance level.

The F-15 SPO was the only organization which failed to show a definite position trend in their response pattern. Only fifty-four per cent of the respondents indicated a "yes" response. Further examination of the comments made by negative respondents revealed the fact that in this program the AFPRO was involved in the validation phase. Respondents felt that the degree of involvement, in their program, was sufficient and, therefore, responded "no" to the question of more involvement.

Several B-1 managers pointed out the fact that personnel with AFPRO experience were involved in the source selection process. They further stated that the experience of these personnel greatly enhanced the flow of source selection proceedings.

Specified comments in favor of AFPRO involvement in the validation phase included:

1. More AFPRO involvement in the early stages of each program will increase SPO awareness of contractual

requirements and will improve the overall acquisition process.

2. Early involvement erases the problem of establishing the SPO-AFPRO team during the later, more complex stages of the program.

3. Since the AFPRO is the in-plant administrator, it should be involved directly in all phases of the program.

Comments which followed most negative responses either stated current involvement was adequate or no AFPRO involvement was required. None of the definite negative comments were of sufficient detail to warrant restatement.

Mention should be made of the fact that the Air Force Systems Command (AFSC) has recognized the importance of early AFPRO involvement in the acquisition process. AFSC Regulation 800-9, published in August 1971, calls for the establishment of an AFPRO cadre prior to source selection. (45) It appears that the question analyzed above will be applicable to future programs.

Question 7: Do current publications (Manuals, Regulations, MOA's, etc.) adequately define the SPO-AFPRO functional relationship?

Adequacy of Current Publications

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	12	10	2	.019	.410
	AFPRO	11	10	1	.006	
F-15	SPO	15	11	4	.059	.269
	AFPRO	21	17	4	.004	
B-1	SPO	12	8	4	.194	.333
	AFPRO	12	8	4	.194	

Table 3.7

Published guidelines which establish organizational policies and procedures provide a major impact on performance and effectiveness. This is true of any organization whether it is military or civilian. The published directives become the framework or starting point for initiating organizational actions and decisions. Such is the case with any major defense system acquisition program. A multitude of DOD and Air Force publications guide the interorganizational and intraorganizational actions of both the SPO and the AFPRO. The Memorandum of Agreement (MOA) provides further organizational guidance by defining the general APO-AFPRO functional relationships for a given program. The MOA is much like a contract between the SPO and the AFPRO.

Question 7 asked the SPO and the AFPRO managers what their opinion was with regard to the adequacy of the publications which outlined their interorganizational actions. As indicated by Table 3.7, all responding organizations generated a positive response pattern. All six organizations indicated "yes" by a margin of at least two to one.

The C-5A program is the oldest of the three programs used in this study. As a result, managers in this program have been exposed to the publications which pertain to all stages of the program. Both the C-5A SFO and the AFPRO generated statistically significant "yes" response groups.

Few notable comments were generated as a result of this question. However, one area which several individuals discussed was the adequacy of the MOA. Personnel indicated that the MOA becomes outdated as the program evolves and thus becomes a useless document. A logical solution to this problem was generated in an interview at the McDonnell Douglas AFPRO. It was stated that the MOA should be a dynamic, evolutionary document which changes with the program and is continually evaluated with regard to its currency and adequacy. (4)

Question 8: Is the AFPRO providing significant contribution in the area of configuration change control?

AFPRO Role in Configuration Control

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	11	7	4	.274	.068
	AFPRO	9	9	0	.002	
F-15	SPO	14	12	2	.007	.404
	AFPRO	13	11	2	.011	
B-1	SPO	7	4	3	.500	.408
	AFPRO	6	3	3	.656	

Table 3.8

When a change is made which affects the design of the aircraft or its supporting equipment, a resulting change must be made in the contract. Depending on the details of the design change, either cost savings or additional expenditures can enter the picture. The SPO is responsible for the final decision with regard to the major design alterations. However, the AFPRO plays an important part in this function by evaluating all change proposals. If the change is minor, the AFPRO may approve it. If the change is more involved, the AFPRO will evaluate it and make recommendations to the SPO with regard to the feasibility of the change.

The Configuration Management Division organization is the organization which is tasked to handle the design changes. The engineering staff which exists in both the SPO and the AFPRO is involved in many crucial program

decisions. Effective coordination of SPO and AFPRO efforts in the area of configuration control is a definite prerequisite for overall program success. Question 8 directed attention at the AFPRO role in configuration control.

The C-5A and F-15 programs have had a far greater degree of exposure to configuration control problems than the B-1. When the B-1 moves more deeply into full-scale development, awareness of this function should obviously increase. Of the four organizations representing the C-5A and the F-15 programs, only the C-5A SPO failed to generate a statistically significant "yes" response group. Even in this case, however, sixty-four per cent of the respondents favored a "yes" response.

Question 8 was directed at one specific functional area and therefore generated many "uncertain" responses. However, several noteworthy comments were made by respondents who were familiar with the configuration control function. The most significant comments came from B-1 AFPRO engineers who noted that the establishment of a SFO cadre has all but eliminated their responsibility in this area of concern.

Question 9: Do existing informal SPO (AFPRO) contacts adequately promote project coordination?

Informal SPO/AFPRO Contacts

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	15	10	5	.151	.198
	AFPRO	13	11	2	.011	
F-15	SPO	16	15	1	.0003	.206
	AFPRO	20	16	4	.006	
B-1	SPO	11	10	1	.006	.424
	AFPRO	13	11	2	.011	

Table 3.9

Organization charts serve to define lines of communication and formalize the coordination process. Much more is involved in the process of interorganizational interaction than the formalized, structural communication links. The informal ties are everpresent in all organizations. They can serve to enhance or detract from the overall effectiveness of the organization.

In responding to Question 9, personnel were reflecting their opinion of the adequacy and effectiveness of informal ties within the associated SPO or AFPRO. Except in the case of the C-5A SPO, the binomial null hypothesis was rejected at the .05 level, indicating the significance of the positive response category.

It appears sufficient to state that the informal communication channels are adequately established. This

statement is further justified by comments such as the following:

1. A well-established person-to-person, informal relationship exists which has resulted in increased effectiveness.

2. Free informal contact between the SPO and the AFPRO are encouraged and are invaluable to program visibility and understanding.

3. Personal contacts will never be replaced by formalized, structured lines.

4. Coming from the SPO to the AFPRO, I carried with me many personal ties. These communication links have proven to be invaluable.

As a final note, it should be mentioned that several respondents noted the need for face-to-face contact as a prerequisite to good informal communication. They stated that weaknesses in the chain could be noted when the periodic personal contact was absent.

Question 10: Do the present telephonic and written communication channels adequately support SPO-AFPRO interaction?

Adequacy of Communication Channels

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	15	8	7	.500	.040
	AFPRO	13	12	1	.002	
F-15	SPO	17	16	1	.0001	.044
	AFPRO	23	15	8	.105	
B-1	SPO	12	10	2	.019	.391
	AFPRO	12	11	1	.003	

Table 3.10

The available communication tools within a given organization play an important role in the overall effectiveness of communication channels. In the absence of adequate physical or mechanical means of communication, effective personal contact is definitely hindered. With regard to SPO-AFPRO communication and coordination, the geographical separation of these organizations mandates the requirement for good communication modes.

Question 10 asked the respondents if written and telephonic communication channels were adequate. The C-5A SPO showed a rather evenly divided response pattern. The C-5A AFPRO, however, indicated a positive response pattern which was significant at the .05 level of significance. Only one of the thirteen AFPRO respondents indicated a

negative response. The difference in the SPO and the AFPRO response patterns was further emphasized in the results of the Fisher test. The .040 probability caused the null hypothesis to be rejected at the .10 significance level. It could, therefore, be stated that a statistically significant difference in response patterns existed between the SPO and the AFPRO.

The F-15 program also showed a difference in response patterns which was significant at the .10 significance level. In the case of the F-15, however, it was the SPO respondents that indicated the strong positive preference while the AFPRO respondents displayed the less positive pattern.

The B-1 SPO and AFPRO are the furthest separated organizations from the standpoint of geographical distance. This was one of the factors which affected the decision to establish the SPO detachment at the AFPRO. Both the B-1 SPO and the AFPRO indicated a positive response pattern which was significant at the .10 level of significance. The B-1 AFPRO, in fact, displayed a pattern significant at the .05 level of significance. Both parties agreed that communication channels were adequate.

Negative commentary generated in response to this question was relatively weak and did not follow any identifiable pattern. Respondents stated that the AUTCVON system caused intermittent problems and that improvement was needed in the area of written correspondence. However, these comments were definitely in the minority.

The favorable comments included:

1. Our direct line to the SPO has greatly enhanced communication effectiveness (F-15 AFFRO).

2. Excellent communication channels have established real time visibility which has been lacking in prior programs.

3. I have been involved with programs which lacked the sophisticated channels present in this program. The value of these channels becomes more apparent every day.

4. Your question made me stop and think about something I have failed to acknowledge the importance of.

Question 11: With regard to your functional area, are SPO and AFFRO capabilities being fully utilized?

Utilization of Capabilities

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	16	12	4	.038	.333
	AFFRO	13	10	3	.046	
F-15	SPO	17	15	2	.001	.184
	AFFRO	20	13	7	.132	
B-1	SFO	11	9	2	.033	.178
	AFFRO	12	7	5	.387	

Table 3.11

The substance and relevance of this question need little introduction. Most people will acknowledge the fact that complete utilization of individual capabilities is a

difficult organizational objective to attain. Due to the structure and substance of this question it was felt that individual comments were very important regardless of the response pattern that evolved. It is for this reason that the rather extensive comment listing follows the next paragraph.

With regard to the statistical analysis, all organizations indicated a positive response preference. All three SPO's showed a positive pattern that was significant at the .10 significance level. However, only the C-5A AFPRO rendered a statistically significant "yes" response pattern.

Noteworthy comments made in response to this question included:

1. There is no better environment for the complete utilization of capabilities than the SPO or the AFPRO.
2. Technical capabilities appear to be fully utilized in both organizations, but the AFPRO could be more utilized in the area of future planning.
3. My counterpart and I are handicapped by contractual misinterpretations and the lack of detailed objectives.
4. I have never experienced full use of AFPRO capabilities in any given program.
5. The AFPRO is always in a position of having to prove its competence in the eyes of SPO managers. This delays the initiation of AFPRO utilization.

6. The volume of paperwork continues to hinder our complete utilization.

7. If the overall AFPRO organization was more aggressive and flexible, their capabilities could be more fully utilized.

The general commentary which both SPO and AFPRO respondents generated seemed to revolve around extensive SPO utilization and incomplete utilization of AFPRO capabilities. No comments indicated any possible resolution to this problem. However, it appears that managerial consideration is warranted in this area.

Question 12: Do the mutual efforts of SPO and AFPRO personnel result in the timely identification and prompt resolution of potential problems?

Timely Resolution of Potential Problems

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	14	7	7	.605	.042
	AFPRO	11	10	1	.006	
F-15	SPO	14	14	0	.0001	.114
	AFPRO	21	17	4	.004	
B-1	SPO	10	8	2	.955	.418
	AFPRO	9	7	2	.090	

Table 3.12

Timely identification and resolution of potential problems could be considered part of the mutual job description for SPO and AFPRO managers. If potential problems are

ignored, they become tomorrow's real problems and often result in an expenditure of both manpower and money that could have been avoided. Due to the AFPRO's in-plant location, problem identification is more within its task group. Problem resolution usually becomes a SPO task due to its position at the top of the program management chain.

Question 12 asked SPO managers if their AFPRO counterparts were identifying potential problems in a timely manner. It also asked AFPRO personnel if the SPO promptly resolved AFPRO identified problems. The resulting grouped responses provided an indication of the effectiveness of the mutual efforts of SPO and AFPRO counterparts with regard to the problem solving task.

The C-5A respondents combined to produce a Fisher probability which was significant at the .10 significance level. A check of the organizational response pattern provided the reason for the Fisher results. The C-5A SPO indicated an evenly distributed response pattern while the C-5A AFPRO showed a definite positive trend. The "yes" response group for the C-5A AFPRO was significant at the .05 level of significance. The literal interpretation of the C-5A response groups is that the SPO is promptly reacting to problem areas but there exists some conjecture with regard to AFPRO problem identification.

The F-15 program respondents showed a definite positive response pattern in both the SPO and the AFPRO. Both organizations rendered highly significant "yes"

response patterns. Only four of thirty-five program respondents indicated a negative response. All four individuals were in the AFPRO. The B-1 group followed the positive trend established by the F-15.

The ideas of promptness and timeliness which were built into this question generated several negative comments:

1. The SPO has always given prompt "consideration," but on several occasions it has failed to provide prompt "resolution."
2. Some problems have not been ignored, but they were placed on the back burner.
3. The SPO position is often "we will get to it." The AFPRO position continues to be "when."

Comments which followed "yes" responses included:

1. The AFPRO is promptly identifying potential problems, but AFPRO personnel must realize that the SPO has many serious problems to evaluate besides those discovered by the AFPRO.
2. Communication channels are such that they enhance mutual problem resolution.
3. The AFPRO understands and has adequately discharged its responsibility as the eyes and ears of the SPO.

A final comment is reproduced below which appears to indicate the general consensus of opinion established by a majority of the respondents:

The AFPRO's visibility does not provide the cradle-to-the-grave information on which to evaluate

potential problems. The difference between AFPRO focus (production) and SPO focus (program life cycle) must be considered when timeliness of problem resolution is discussed.

Question 13: Does SPO-AFPRO geographical separation handicap the accomplishment of program objectives?

#### Geographical Separation

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	16	4	12	.038	.147
	AFPRO	10	5	5	.623	
F-15	SPO	16	3	13	.011	.304
	AFPRO	23	3	20	.001	
B-1	SPO	14	6	8	.395	.069
	AFPRO	13	1	12	.002	

Table 3.13

Any research in the general topic area selected for this thesis would be incomplete without considering the problem of physical separation. The System Program Offices for Air Force acquisition programs are generally not located near the contractor's plant and the AFPRO. How does this separation affect the overall program?

The C-5A SPO generated a negative response pattern which was significant at the .10 level of significance. The associated AFPRO, however, split the ten useable responses evenly between the positive and negative sides. Both the F-15 SPO and AFPRO showed a significant negative response pattern. In the case of the F-15, however, the dist e

between St. Louis and Dayton is the shortest represented among the three programs.

The B-1 has established the SPO detachment co-located with its associated AFFRO. This approach was discussed earlier in this chapter. In light of this arrangement, the authors anticipated a highly negative response pattern from the B-1 organization. The B-1 AFFRO did generate such a pattern. The AFFRO's negative pattern was significant at the .05 level of significance. SPO respondents, however, were negative in their pattern of response but to a far lower degree of significance. No noteworthy negative comments from B-1 SPO personnel could be isolated to provide further insight in this area. The general consensus of opinion revolved around the fact that the distance between Los Angeles and Dayton was hard to overcome. Whether or not time zone difference was implied cannot be stated because no respondent mentioned this factor.

Noteworthy comments included:

1. The situation represented by the F-15 is ideal; not too far, not too close.
2. Each office has its specific function and with good communication geographic location is of little importance.
3. Geographic separation is an advantage rather than a disadvantage because it allows more time for work and less for time-consuming meetings.
4. Telephonic and written communication together

with frequent travel overcome any problems associated with geographic separation.

5. The essence of the AFPRO's existence is the SPO-Contractor separation.

The general commentary on Question 13 indicated that geographical separation did not hinder the accomplishment of the system function and mutual understanding and awareness overcome physical separation problems.

Question 14: Do coordinate SPO-AFPRO projects generate a significant degree of duplicated effort?

#### Duplicated Effort

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	13	3	10	.046	.355
	AFPRO	12	2	10	.019	
F-15	SPO	14	3	11	.029	.104
	AFPRO	22	11	11	.584	
B-1	SPO	12	2	10	.019	.324
	AFPRO	11	3	8	.113	

Table 3.14

It should follow from Question 14 that if geographical separation is not a problem, duplicated effort should likewise be minimal. Question 14 probed this area of duplicated effort in an attempt to further identify functional counterpart relationship problems.

As Table 3.14 indicates, the general response pattern was negative. Negative responses outnumbered positive responses by better than a two-to-one margin in all but one response group. The F-15 AFPRO split a sizeable group of twenty-two responses evenly between the negative and positive categories. Only two respondents, of the eleven which generated positive responses from the F-15 AFPRO, provided noteworthy comments:

1. There is too much SPO-Contractor direct contact. This results in a duplication of effort which has already been expended by the AFPRO.

2. The SPO often duplicates detailed work that the AFPRO has accomplished in anticipation of keeping SPO counterparts informed. SPO personnel have made special trips to do nothing more than duplicate AFPRO accomplishments.

The most significant negative responses came from the B-1 organizations. Mention should be made of the fact that none of the B-1 respondents commented on duplicated effort resulting from the establishment of a SPO detachment. B-1 commentary included:

1. Some duplication is unavoidable but the specific NOA written for this program eliminates the majority of duplicated effort.

2. Authority boundaries are well defined and the result is very little duplicated effort.

3. A clearly defined organizational relationship, coupled with a concise MOA, reduces duplicated effort in the program.

The organizational structure which exists in the acquisition environment makes duplicated effort almost unavoidable. Most respondents indicated this fact in their commentary. The degree of duplication is what SPO and AFFRO managers must concentrate on. Continuous SPO-AFFRO communication and coordination should serve to all but erase this problem area.

Question 15: Do any informal policies or procedures exist which you feel should be added to the MOA?

Adequacy of MOA

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	14	3	11	.029	.158
	AFFRO	11	0	11	.0005	
F-15	SPO	11	3	8	.113	.319
	AFFRO	21	6	15	.039	
B-1	SPO	11	0	11	.0005	1.000
	AFFRO	13	0	13	.0001	

Table 3.15

The Memorandum of Agreement (MOA) was explained in this chapter. It is the operational contract which defines coordinate SPO and AFFRO activities. Question 15 probed the adequacy of the MOA within each program studied. As was the

case with Question 11, individual comments are the most pertinent portion of this narrative. Thus, an extensive list of comments are reproduced following the next paragraph.

As Table 3.15 indicates, negative responses outweighed positive responses by more than a two-to-one margin for all organizations. The C-5A respondents and B-1 respondents were very strong in their negative reaction to this question. None of the B-1 respondents made a positive response. The reader will recall that comments were made by B-1 personnel on Question 14 indicating that the B-1 MOA is very complete and definitive. This fact is reflected in the B-1 response to Question 15.

Due to the fact that F-15 personnel provided seventy-five per cent of the "yes" responses, noteworthy comments from this group have been isolated:

1. The current MOA warrants a greater degree of definition but the most important aspect is people must abide by the MOA provisions. This is not being done in all cases.
2. It should be added to the MOA and enforced that all contacts with the contractor must go through the AFPRO.
3. The MOA should be expanded as solutions to problems are defined. It should be an evolutionary document.

Of the many negative responses rendered, those which were noteworthy included:

1. Too many written procedures kill organizational flexibility. Don't build a cookbook.

2. People must take up where the MOA leaves off. Too much definition can do more bad than good.

3. If SPO and AFFRO counterparts build a good working relationship, a piece of paper is not needed to define this relationship.

4. The MOA gets the SPO-AFFRO relationship started but over detailing this document is not required for smooth program continuity.

5. We have established an informal working agreement which defines areas not covered in the MOA. Further definition would be impossible.

It appears that the MOA is a portion of the SPO-AFFRO relationship which warrants further investigation. Although the numerical response data indicated that no MOA additions are required, personnel qualified their responses by mentioning other MOA problem areas. Even personnel who stated nothing needs to be added to the MOA made comments to the effect that the MOA is a problem area. They stated that the MOA was over definitive, destroyed flexibility and hindered overall program effectiveness.

Question 16: Does the MOA sufficiently define those responsibilities which deviate from the standard contract administration functions as outlined in ASPR 1-406?

Sufficiency of Definition Within MOA

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	9	7	2	.090	.235
	AFPRO	9	9	0	.002	
F-15	SPO	14	12	2	.007	.380
	AFPRO	19	17	2	.0005	
B-1	SPO	10	10	0	.001	.524
	AFPRO	11	10	1	.006	

Table 3.16

Section 1-406 of the Armed Services Procurement Regulation (ASPR) contains the details pertaining to standard AFPRO procedures. When the SPO forms an alliance with an AFPRO, any function which is not in ASPR 1-406 that the SPO wants the AFPRO to perform should be included in the MOA. This is one of the primary reasons for the initiation of an MOA.

A recent thesis which was examined in conjunction with this research pointed out that the topic area covered in Question 16 was a definite problem area. (13) It was due to this fact that the authors included this topic in the questionnaire. As Table 3.16 indicates, the response patterns strongly favored the positive side of the response scale. Of the seventy-two useable responses generated

by Question 16, only seven fell on the negative side. The binomial probabilities were significant at the .05 level of significance for all organizations except the C-5A SPO. Even in this case, however, "yes" responses outnumbered "no" responses by a better than three-to-one margin.

None of the negative comments were of noteworthy substance. With regard to general commentary, it appears sufficient to state that the MOA's appear quite adequate in this area. They have sufficiently extended the definition of AFFRO responsibilities found in ASFR 1-406.

Question 17: Should there be more AFFRO involvement in the establishment of inspection, testing, and other quality assurance requirements?

#### Establishment of Quality Assurance Requirements

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SFO	12	9	3	.073	.341
	AFFRO	9	6	3	.254	
F-15	SFO	12	2	10	.019	.050
	AFFRO	19	10	9	.500	
B-1	SFO	12	7	5	.387	.352
	AFFRO	8	5	3	.363	

Table 3.17

The quality assurance function had been unique to the AFFRO environment until the F-15 program established a counterpart quality assurance group within the SPO. Even in the case of the F-15, however, the actual details of

quality assurance are primarily carried out by the AFFRO. The AFFRO importance in this functional area is readily obvious due to the definition of the quality assurance role. This function oversees contractor production efforts and insures that they meet or exceed established contract standards. The AFFRO, being the in-plant arm of the SPO-AFFRO team is the obvious choice for this task.

The preliminary interviews, which were noted earlier, indicated the fact that a possible problem area existed with regard to the quality assurance function. The AFFRO handles the quality assurance tasks, but the SPO and the contractor establish the quality assurance procedures and guidelines. Question 17 asked the respondent whether the AFFRO should be more involved in establishing the quality assurance guidelines which it will be working with as the program progresses.

The response to Question 17 was predominantly positive, but no organization established a statistically significant positive response pattern. The F-15 SPO was the only organization showing a negative response pattern and in this case, the pattern was significant at the .10 level of significance. The Fisher test for the F-15 program was borderline significant and, therefore, requires more data to substantiate the difference in response patterns.

Both the F-15 and B-1 respondents indicated that the AFFRO was involved in the establishment of quality assurance, testing, and inspection requirements. They further stated that as these requirements evolve and change

with the program, the AFPRO provides the major inputs to establish new procedures. This type of comment followed both positive and negative responses based on personal interpretation of the question. It appears that in the B-1 and F-15 programs, AFPRO involvement is adequate. C-5A commentary indicated that more AFPRO involvement is warranted. Of course, the word involvement is only a point of departure and requires further definition in all cases.

Personnel calling for more AFPRO involvement stated:

1. This is the AFPRO's major area of responsibility and maximum AFPRO participation is warranted.
2. The above functions are totally AFPRO responsibilities and the establishment of procedures should be also totally delegated to the AFPRO.

The general negative commentary was as noted above. Negative respondents stated that the AFPRO is sufficiently involved at present and further involvement is not warranted.

Question 18: Does the status reporting system accurately reflect the actual progress of the program?

Status Reporting System

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	13	9	4	.133	.323
	AFPRO	7	4	3	.500	
F-15	SPO	13	10	3	.046	.164
	AFPRO	18	17	1	.0001	
B-1	SPO	9	6	3	.254	.341
	AFPRO	12	9	3	.073	

Table 3.18

The authors have been made fully aware of the potential value of an accurate management information system through courses in the AFIT School of Systems and Logistics. The design of the information system is a difficult task, but the well-designed system is an invaluable management tool. The information system depicts data which can be used to carry out all the respective functions of management. If the management information system is poorly designed, inaccurate, or loaded with out-of-date information, it becomes as big a burden as a good system is an asset.

The status reporting system in the SPO-AFPRO environment is a typical management information system. A countless variety of computer print-outs comprise various elements of the reporting system. In total and in part, these print-outs should reflect current program status. Question 18

directed attention toward the adequacy and accuracy of individual program reporting systems.

All the responding organizations indicated a positive response pattern. However, only the F-15 program rendered a statistically significant response pattern. F-15 AFPRO respondents showed a positive preference which was significant at the .05 level of significance. No other conclusive statements can be made based on the distribution of response data.

Respondents indicating that the reporting system accurately reflected program progress stated:

1. AFPRO inputs to the system keep it timely and accurate.
2. CSCSC has been a definite asset in this area.
3. The reporting system can never be accurate to the "nth degree," however, it does show progress on a near as possible real time basis.

Negative commentary with regard to status reporting system accuracy included:

1. The program is always far ahead of the reports. Progress is just too fast and complex to expect accurate reporting.
2. AFPRO reports are very accurate and timely, but the contractor only presents the good side of the coin. Contractor bias destroys the value of the system.
3. Manpower requirements force management by exception and prevent accurate reporting on all aspects of the program.

Question 19: Are contract negotiations which are delegated to the AFFRO efficiently and effectively accomplished?

AFFRO Contract Negotiations

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	10	9	1	.0107	.455
	AFFRO	12	12	0	.0002	
F-15	SPO	10	8	2	.0547	.385
	AFFRO	14	11	3	.0287	
B-1	SPO	11	11	0	.0005	1.000
	AFFRO	9	9	0	.0020	

Table 3.19

The primary contracting officer in the overall program is located within the SPO organization. The AFFRO contract functions are limited to administration and secondary negotiations. Negotiation tasks handled by the AFFRO usually are limited in scope and dollar ceilings. However, the negotiations that are delegated to the AFFRO must be handled in an efficient manner. Effective handling of contract negotiations serves to establish the competence of the AFFRO in the eyes of both the contractor and the SPO.

When questioned on the AFFRO role in contract negotiations, the majority of the respondents indicated a positive attitude. Only nine per cent of the useable responses fell on the negative side of the scale. Of the

six responses making up this nine per cent, five were generated by F-15 respondents. A check of the binomial probabilities serves to indicate that AFPRO negotiations in the C-5A and B-1 programs are being handled adequately.

The F-15 respondents rendered only two noteworthy comments in qualifying their negative responses:

1. The SPO engineering division has not adequately supported AFPRO negotiations, and this had reduced AFPRO effectiveness.

2. On several occasions the SPO has been forced into the negotiations due to the fact that the AFPRO lacks the expertise present on the SPO staff.

The general positive commentary indicated that the overall efforts of the AFPRO contract negotiation personnel are highly effective.

Question 20: Do provisions exist for joint SPO-AFPRO meetings to facilitate the resolution of major problems?

Joint SPO-AFPRO Meetings

SYSTEM	ORGN	RESP	YES	NO	BINOMIAL	FISHER
C-5A	SPO	17	17	0	.0000	1.000
	AFPRO	12	12	0	.0002	
F-15	SPO	17	17	0	.0000	1.000
	AFPRO	20	20	0	.0000	
B-1	SPO	10	8	2	.0547	.418
	AFPRO	9	7	2	.0898	

Table 3.20

Question 20 was included as the final question to provide insight into whether or not formal arrangements existed for functional counterpart personal contact. The results of this question are readily apparent as Table 3.20 indicates. Only four respondents favored a negative response and all of these responses were concentrated in the B-1 program. Only one of the four negative respondents qualified his response by stating that the SPO detachment has eliminated the need for SPO-AFPRO contact.

The list of positive responses is extensive, but the primary comment that respondents emphasized was the importance of personal contact. They agreed that joint SPO-AFPRO meetings greatly enhanced timely problem identification and resolution.

Summary

Chapter 3 has provided a detailed analysis of the responses generated by SPO and AFPHO personnel to pertinent organizational questions. The examination of the response patterns and individual comments has provided the authors with the information from which meaningful conclusions and recommendations may be drawn. The reader will undoubtedly have several personal conclusions which may be compared with those provided by the authors in Chapter 4.

## Chapter 4

### FINDINGS AND RECOMMENDATIONS

This study has concentrated on an in-depth look at the functional relationships between SPO and AFPRO counterparts. The primary data collection tool, a questionnaire, provided extensive data contributions. The data were subjected to a thorough analysis in Chapter 3. Based on the research questions and objectives stated at the outset of this research and the analysis of the questionnaire, the authors have arrived at several conclusions. These conclusions, coupled with research findings and recommendations, are contained in the following paragraphs.

#### Functional Relationship Definition

The authors were fully aware of the multitude of formal documents which exist as a guideline for SPO and AFPRO operation. The first of the five research objectives was to find out whether the SPO-AFPRO functional relationship warrants further definition. The point here is not to merely add to the already rather long list of guideline documents, but to refine and tailor existing publications and add detail if and where it is needed.

Is the existing SPO-AFPRO functional relationship sufficiently defined for successful operations within the

constraints of the current operational environment? Both questionnaire respondents and interview subjects generally agreed that the extent of the published definition was adequate. Their conclusions were that some refinement may be in order with regard to the MOA, but in the area of regulations, manuals, etc., most topics were adequately covered.

The new 800 series AFSC manuals and regulations is replacing the 375 series of manuals. These publications are concerned with the management of weapon system acquisition. Individuals who were involved in this revision of the 375 series have noted that the 800 series provides more detail and eliminates questionable areas of the 375 series. The authors were unable to get copies of the complete 800 series, but a copy of AFSC Pamphlet 800-3 was obtained prior to this writing. Based on AFSC Pamphlet 800-3, it appears that the new series is indeed more comprehensive and definitive. The new series can only add to the positive conclusion that sufficient SPO-AFPRO functional definition does exist.

With regard to the MOA, the authors side with the comments made by Mr. George R. Clarkson of the F-15 AFPRO. The MOA must evolve with the program. It must be a dynamic document which maintains program currency. The addition of chapters to the MOA as the program progress warrants is a possible solution to MOA inadequacy. There is no readily apparent method by which personnel can foresee all MOA requirements at the outset of the program. This fact should

be acknowledged and a trend toward the evolutionary MOA should be established.

Organizational and  
Functional Alignment

The existence of functional counterparts in the SPO and the AFPRO, mutual understanding between counterparts, and counterpart coordination were areas covered in the questionnaire. Selected interviews also concentrated on these aspects of acquisition management. In the case of both the questionnaire responses and personal interviews, the general consensus is quite favorable. SPO and AFPRO personnel acknowledged the existence of primary functional contacts in the complimentary organizations. They further stated that their counterparts displayed a sufficient level of understanding with regard to their mission and responsibilities.

There is some degree of debate with regard to the coordination of program proposals and decisions. The authors strongly feel that the AFPRO should be contacted on all contractor-related decisions and proposals. If a program decision is contemplated which may in some manner affect the AFPRO, the AFPRO management team should be made aware of this fact. None of the questionnaire comments or interview statements substantiated eliminating the AFPRO from this type of coordination. Rather than spending time rationalizing reasons why the AFPRO should not be involved in a decision, or at least be made aware of the decision,

SPO managers should spend that time coordinating with the AFPRO.

### Communication Channels

Geographical separation appears to pose no significant problem with regard to effective SPO-AFPRO functional interaction. The fact that, in most cases, specific functional counterparts have been established, is a major reason behind the apparent non-existence of problems that separation may cause. Another contribution to overcoming the separation element is well-established communication channels. In this context a communication channel includes the physical modes of communication as well as the people or the communicators.

The F-15 program possesses an excellent communication mode. A simple seven digit number can be dialed from a standard home phone line in Dayton to contact the McDonnell Douglas AFPRO in St. Louis. This overcomes AUTOVON problems and greatly benefits communication flow.

The physical communication devices utilized for SPO and AFPRO coordination must be as simple as possible. Any problem with this physical element of the channel can only serve to deter coordination and thus hinder the accomplishment of program goals. Any internal suggestions directed toward modes of communication warrant managerial attention.

As stated above, people are as much, if not more, a part of the channel as the physical modes. Face-to-face contact was stressed by questionnaire respondents as the

only way to effectively initiate the functional relationships. They stated that once this personal identification was achieved, communication flow became firmly established and more meaningful. The authors were highly satisfied with the response to Question 20. Through the arrangement of formal SPO-AFPRO problem solving meetings, management has established the means for the highly beneficial face-to-face contact.

While on the topic of communication channels, the authors would like to present an idea concerning program status reporting and overall program awareness. The computer-generated status data is usually single-function oriented and highly detailed. Program visibility is maintained by top-level managers but only a limited effort has been made to extend this visibility to lower echelons. In light of these facts, the generation of a periodic, informally structured, program newsletter is suggested. This newsletter would be made available to all SPO and AFPRO personnel. The authors feel that the newsletter, or a facsimile thereof, would serve to enhance the identification of individuals with program goals and objectives.

#### Management Practices and Problems for Consideration

The acquisition programs of the future will undoubtedly deviate from the published standards with regard to organizational structure. Whether it will be an attempt to establish a new precedent of test of management

innovation, it appears that alterations are unavoidable. This fact is due to the constantly changing environment which precludes the currency of published standards.

The F-15 and B-1 programs are representative of young, dynamic management ideas. This fact pervades the outlook of organizational managers involved with these programs. Both programs have deviated somewhat from the standard structure in an attempt to enhance program control and success. Of course, it will be several years before success or failure can be measured for these programs, but some statements can be made with reference to current program status.

The co-located SPO detachment is very controversial. Both SPO and AFPRO managers voiced firm opinions on this program management innovation. The primary concern which was voiced revolved around the fact that the SPO detachment can grossly undermine the AFPRO. Most of the firmly negative comments came from C-5A and F-15 AFPRO personnel. B-1 personnel basically questioned the degree of SPO detachment size and interface with the contractor. They did not display a negative attitude with regard to the mere existence of the detachment.

The authors feel that the general co-location idea has some proven degree of merit. Personnel at the B-1 engine AFPRO in Evendale, Ohio, expressed the fact that the small cadre of co-located SPO engineers has proven to be of great value. Comments received from AFPRO personnel located

in Los Angeles also noted the value of on-site SPO engineers. The ability of the SPO to acquire quality engineering talent has been put to good use in the B-1 program. Rather than isolating the engineers at the SPO, the B-1 managers have placed them where their talents may be best utilized.

The authors question any duplication of AFPRO functions through the SPO detachment principle. The co-location idea must be carefully and selectively applied. If SPO expertise can add to program effectiveness, it should be applied where it can be best utilized.

The B-1 program should serve as the test ground for this new management idea. Careful study should be made and documentation generated with regard to areas of success and/or failure of the co-location principle.

Early involvement of the AFPRO in the acquisition life cycle has been acknowledged by Air Force Systems Command as being a definite aid to program success. The authors had anticipated recommending the idea of involving the AFPRO in the validation phase during the initial stages of the research. The publication of AFSC Regulation 800-9 appears to be a definite step forward. Full utilization of AFPRO talents is just as important as utilizing SPO expertise when and where it is needed.

The authors feel that AFPRO involvement should start early in the acquisition program. In addition, the extent of this involvement should be increased. To be specific, the AFPRO should play a major role in the establishment of quality assurance guidelines. The rationale

behind this statement rests with the fact that quality assurance is an AFPRO task and, thus, the AFPRO maintains a great degree of experience and expertise in this area. Once again, AFPRO talents warrant full utilization and effective application.

#### Areas of Future Research

The classical SPO-AFPRO-Prime Contractor topic area has been extensively researched. Due to the complexity and breadth of this topic area, the possibility for future research will continue to exist. The authors would like to suggest that the operation of sub-contractors, in conjunction with the main contractor and the AFPRO, appears to be a viable research area. The multitude of subcontractors involved in a major weapon system procurement warrants more attention and study. They have a major impact upon ultimate program success.

The entire concept of a co-located SPO detachment warrants academic attention. An in-depth analysis of benefits, pros and cons, etc., could serve to tailor this function and enhance the effectiveness of its application in the future.

An alternative to the co-location concept warrants future research. This alternative would involve a revised approach to systems acquisition within the Air Force. It would eventually place all program management activities at the prime contractor's plant. A SPO cadre would be established and located with the appropriate AFSC buying division

during the conceptual and validation phases. Once the Secretary of Defense approves the request to enter full scale development, the SPO would move to the prime contractor's plant. The functions and responsibilities currently accomplished by SPO and AFPRO personnel would be transferred to the proposed unified project office.

SPO-AFPRO personnel rotation and orientation appears to be a definite area for research. All questionnaire respondents who indicated that they had rotated from one office to another stated that they, in turn, benefited from this rotation. Also, the orientation of initial entrants to the program warrants study and documentation. The orientation principle intended here is comprehensive in nature. At present, AFPRO personnel are trained with regard to their being "the eyes and ears of the SPO." Only a token effort has been made to expose new SPO personnel to the AFPRO roles and its requirement for SPO support.

As a final recommendation for research, the authors present what is felt to be an extremely viable topic area. The small program offices have received little academic attention. The so-called "Basket SPO's" represent complex activities which are deserving of academic attention. These small-scale SPO's procure items such as aircraft engines and helicopters and manage follow-on procurement for established Air Force weapon systems. Basket SPO managers become involved with complex interservice contracts and many other areas outside the realm of the major SPO management.

### Conclusion

This thesis has provided a detailed analysis of one management area in the Air Force weapon system acquisition process. The area concentrated on in this text involved the functional relationship of the System Program Office and the Air Force Plant Representative Office. At the outset of the research topic search, the authors chose the general area of AFPRO support of the SPO. The idea of mutual support as opposed to unilateral support evolved as a more viable and meaningful research topic. The authors have attempted to bring this same feeling across to the reader throughout the thesis.

With regard to the specific area of functional SPO-AFPRO relationships, the authors feel that management efforts in both offices have served to establish an effective framework. The noteworthy comments, coupled with the statistical analysis in Chapter 3, have identified elements of the functional relationship that, if unattended, could weaken the framework. Personnel in current and future programs should assess conditions in their functional environment with regard to the pros and cons noted in this thesis. If, during this assessment, any refinement is made which increases operational efficiency or functional effectiveness, the purpose of this research will be amply served.

## BIBLIOGRAPHY

1. Andre, Colonel Dan. Commander, McDonnell Douglas Air Force Plant Representative Office, St. Louis, Missouri. Personal interview. 21 October 1971.
2. Ayres, Major D.L. Deputy Air Force Plant Representative for C-5A Program. General Electric Company, Evandale, Ohio. Personal interview. 21 October 1971.
3. Baergen, Captain Edward, and Captain John A. Seebacher. "A Case Study of H-3 Helicopter Acquisition and Initial Support Planning." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Systems and Logistics, August, 1968.
4. Clarkson, George F. Technical Assistant F-15 Program Management. AFPRO, McDonnell Douglas, St. Louis, Missouri. Personal interview. 21 October 1971.
5. Cleland, David I., and William R. King. Systems Analysis and Project Management. New York: McGraw Hill, 1968.
6. Doty, Paul R. B-1 SPO, Program Control Division, Personal interview. 23 July 1971.
7. Drucker, P. Landmarks of Tomorrow. New York: Harper and Rowe, Inc., 1959.
8. Fitzhugh, Gilbert W. Chairman of Blue Ribbon Defense Panel, Report to the President and the Secretary of Defense on the Department of Defense. Washington D.C.: U.S. Government Printing Office, 1 July 1970.
9. Fox, Captain Anthony W. C-5 SPO, Directorate of Procurement and Production, Personal interview. 21 April 1971.
10. Goetz, Major Micheal B. Deputy Air Force Plant Representative for B-1 Program. General Electric Company, Evandale, Ohio. Personal interview. 21 October 1971.
11. Hagan, Captain Gary. B-1 SPO, Procurement and Production, Personal interview. 27 July 1971.
12. Hermesmann, Major William J., and Captain Belva D. Walker. "The Role of Doctrine in Air Force Logistics." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Systems and Logistics, August, 1968.

13. Holland, Captain Robert L. "Role Definition in the Decision-Making Process of Weapon Systems Acquisition." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Engineering, December, 1970.
14. Johnson, Richard A., Fremont E. Kast, and James Rosenzweig. The Theory and Management of Systems. New York: McGraw-Hill Book Company, 1967.
15. Kozuma, Lt. Colonel Roger T. F-15 SPO, Engineering Division, Personal interview. 21 April 1971.
16. \_\_\_\_\_, and Captain Frederick T. Dehner. "The Role of the Air Force Plant Representative Office in the Weapon System Acquisition Process." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Engineering, August, 1969.
17. Lavender, William B. C-5 SPO, Production Division, Personal interview. 21 April 1971.
18. Lieberman, Gerald J., and Donald B. Owen. Tables of the Hypergeometric Probability Distribution.
19. Logistics Management Institute. A Manager's Guide to the Acquisition of DOD Systems and Equipment. Task 68-13, January, 1970.
20. Madaffer, Merle. Combat SPO, Engineering Division, Personal interview. 13 July 1971.
21. McDonnell Aircraft Company. The United States Air Force Weapon System Acquisition Process (The Acquisition Phase). St. Louis: McDonnell Aircraft Company, June, 1970.
22. Meehan, Major John D., and Major Thomas O. Millett. "Major Weapon System Acquisition: An Analysis of DOD Management Arrangements." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Engineering, September, 1968.
23. Mosteller, Frederick, Robert E.K. Rourke, and George B. Thomas, Jr. Probability and Statistics. Massachusetts: Addison-Wesley Publishing Company, 1961.
24. Packard, David. An Address to the Armed Forces Management Association. Los Angeles, California, 20 August 1970.
25. Feloquin, Major Dale B., and Major Arthur J. Roscoe. "Systems Management in the United States Air Force-A Review and Critical Analysis." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Engineering, September, 1969.

26. Pierce, Albert. Fundamentals of Nonparametric Statistics. California: Dickenson Publishing Company, Inc., 1970.
27. Poncar, Major Jerry V., and Captain James R. Johnston II. "History and Analysis of the C-5A Program: An Application of the Total Package Procurement Concept." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Engineering, September, 1970.
28. Range, W.R. Summary of Air Force/Boeing Test Program Management Practices, Boeing Company Seattle, Washington, Support Systems Engineering, July 7, 1969.
29. Selby, Samuel M. Standard Mathematical Tables. Ohio: The Chemical Rubber Company, 1970.
30. Shillito, Barry J. "Management of Major Weapon System Acquisition." Defense Industry Bulletin VI, January, 1970.
31. Siegal, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, Inc., 1956
32. Stark, Major Tom. Development Engineering Branch Chief, F-15 AFPRO, McDonnell Douglas, St. Louis, Missouri. Personal interview. 21 October 1971.
33. Stewart, Captain Charles S. B-1 SPO, Procurement Division, Personal interview. 20 April 1971.
34. Sauer, Walter S. C-5 SPO, Production Division, Personal interview. 21 April 1971.
35. Schaffeld, Arthur W. AFPRO-Production Management. General Electric Company, Evendale, Ohio. Personal interview. 13 April 1971.
36. U.S. Department of Defense. Armed Services Procurement Regulation (ASPR). Washington D.C. 1969.
37. U.S. Department of Defense. Contract Administration Manual for Contract Administration Services. Cameron Station, Alexandria, Virginia. December, 1968.
38. U.S. Department of Defense. System/Project Management. DOD Directive 5010.14. Washington D.C. 4 May 1965.
39. U.S. Department of the Air Force. Program Management. AFR 800-2. Washington D.C. 27 July 1971.
40. U.S. Department of the Air Force. Systems Management-System Program Director.

41. U.S. Department of the Air Force. Systems Management-System Program Office (SPO). AFR 375-2 (Rescinded). Washington D.C. 6 March 1970.
42. U.S. Department of the Air Force, Air Force Systems Command. A Guide for Program Management. AFSCP 800-3. Washington D.C. 14 May 1971.
43. U.S. Department of the Air Force, Air Force Systems Command. Air Force Contract Management Division. AFSCR 23-16.
44. U.S. Department of the Air Force, Air Force Systems Command. Guide for Effective Change Processing in Systems Acquisition. AFSCP 375-1. Washington D.C. 8 May 1967.
45. U.S. Department of the Air Force, Air Force Systems Command. Program Office/AFPRO Cadre. AFSCR 800-9. Washington D.C. 10 August 1971.
46. U.S. Department of the Air Force, Air Force Systems Command. Systems Management-System Program Management Procedures. AFSCM 375-4. Washington D.C. 28 May 1969.
47. U.S. Department of the Air Force, Air Force Systems Command. Systems Management-System Program Office Manual. AFSCM 375-3. Washington D.C. 15 June 1964.
48. U.S. Department of the Air Force, Air Force Systems Command. System Program Office. AFSCR 23-43 (Rescinded). Washington D.C. 28 May 1969.
49. Walkowski, Major Raymond J., and Captain William D. Mandigo. "An Analysis of the Department of Defense Contractor Performance Evaluation Program as Used in the Source Selection Process." Master's thesis, Wright-Patterson AFB, Ohio, Air Force Institute of Technology, School of Technology, School of Systems and Logistics, August, 1968.

APPENDIX A  
SPO QUESTIONNAIRE

97

APPENDIX A

SPO/AFPRO FUNCTIONAL RELATIONSHIP QUESTIONNAIRE

SECTION I

Please complete the following:

1. Functional area to which you are assigned \_\_\_\_\_
2. Assigned weapon system \_\_\_\_\_

SECTION II

Please answer the following questions with reference to your functional area. Give general consideration to questions which do not directly pertain to your function.

The numbers one through five are listed after each question. Circle your response in accordance with the response scale shown below and then substantiate your response in the comment area. If you wish to make additional comments, feel free to use the back of the questionnaire.

Your comments will provide valuable information to the researchers and are therefore greatly appreciated.

RESPONSE SCALE

YES		UNCERTAIN		NO
1	2	3	4	5

1. Do you feel that the establishment of a SPO detachment, co-located with the AFPRO, would (does) benefit your program?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Do you have a designated counterpart in the AFPRO?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Do you feel that your functional counterpart (in the AFPRO) has a sufficient understanding of your mission and responsibility?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Do you feel that your AFPRO counterpart should be contacted prior to all SPO interaction with the contractor?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Do you feel that the rotation of personnel between the SPO and the AFPRO would benefit the acquisition process?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Should there be more AFPRO involvement during the validation phase?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Do current publications (Manuals, Regulations, MOA's, etc.) adequately define the SPO-AFPRO functional relationship?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Does the AFPRO provide significant contributions in the area of configuration control?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. Do existing informal AFPRO contacts adequately promote project coordination?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. Do present telephonic and written communication channels adequately support SPO-AFPRO interaction?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. With regard to your functional area, are SPO and AFPRO capabilities being fully utilized?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Do the efforts of AFPRO personnel result in the timely identification of potential problems?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

13. Does SPO-AFPRO geographical separation handicap the accomplishment of program objectives?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

14. Do coordinate SPO-AFPRO projects generate a significant degree of duplicated effort?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

15. Do any informal policies and procedures exist which should be added to the MOA?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

16. Does the MOA sufficiently define those responsibilities which deviate from the standard contract administration functions as specified in ASPR 1-406?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

17. Should there be more AFPRO involvement in the establishment of inspection, testing, and other quality assurance requirements?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

18. Does the status reporting system accurately reflect the actual progress of the program?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

19. Are contract negotiations which are delegated to the AFPRO efficiently and effectively accomplished?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

20. Do provisions exist for joint SPO-AFPRO meetings to facilitate the resolution of major problems?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

21. As a final comment, please indicate any areas of SPO-AFPRO functional interaction which you feel deserve consideration.

APPENDIX B  
AFPRO QUESTIONNAIRE

103

APPENDIX B

AFPRO/SPO FUNCTIONAL RELATIONSHIP QUESTIONNAIRE

SECTION I

Please complete the following:

1. Functional area to which you are assigned \_\_\_\_\_
2. Assigned weapon system \_\_\_\_\_

SECTION II

Please answer the following questions with reference to your functional area. Give general consideration to questions which do not directly pertain to your function.

Use the response scale shown below to make a numerical response to each question. Circle the appropriate number and please substantiate your answer in the comment space provided. If you wish to make additional comments, feel free to use the back of the page.

Your comments will be of major importance in this research and are therefore greatly appreciated.

RESPONSE SCALE

YES	UNCERTAIN			NO
1	2	3	4	5

1. Do you feel that the establishment of a SPO detachment, co-located with the AFPRO would (does) benefit your program?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Do you have a designated counterpart in the SPO?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

3. Does your functional counterpart in the SPO possess a sufficient understanding of your mission and responsibilities?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

4. Does your counterpart in the SPO coordinate all proposals and decisions affecting your functional area prior to the enactment of the decision?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

5. Do you feel that the rotation of personnel between the SPO and the AFPRO would benefit the acquisition process?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

6. Should there be more AFPRO involvement during the validation phase?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

7. Do current publications (Manuals, Regulations, MOA's, etc.) adequately define the SPO-AFPRO functional relationship?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Is the opinion of your AFPRO given sufficient consideration with regard to configuration change control?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. Do existing informal SPO contacts adequately promote project coordination?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. Do the present telephonic and written communication channels adequately support AFPRO-SPO interaction?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. With regard to your functional area, are AFPRO and SPO capabilities being fully utilized?

1 2 3 4 5 Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Do AFFPRO identified problem areas receive prompt SPO consideration and action?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

13. Does AFFPRO-SPO geographical separation handicap the accomplishment of program objectives?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

14. Do coordinate AFFPRO-SPO projects generate a significant degree of duplicated effort?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

15. Do any informal policies or procedures exist which you feel should be added to the MOA?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

16. Does the MOA sufficiently define those responsibilities which deviate from the standard contract administration functions as specified in ASPR 1-406?

1 2 3 4 5 Comment: \_\_\_\_\_

---

---

---

17. Should there be more AFPRO involvement in the establishment of inspection, testing, and other quality assurance requirements?

1 2 3 4 5 Comment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. Does the status reporting system accurately reflect the actual progress of your program?

1 2 3 4 5 Comment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19. Does sufficient authorization and guidance exist for the successful negotiation of contract changes delegated to the AFPRO?

1 2 3 4 5 Comment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

20. Do provisions exist for joint AFPRO-SPO meetings to facilitate the resolution of major problems?

1 2 3 4 5 Comment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

21. As a final comment, please indicate areas of the SPO-AFPRO functional relationship which you feel deserve consideration.

APPENDIX C  
RESPONSE TO QUESTIONNAIRES

109

APPENDIX C  
RESPONSE TO QUESTIONNAIRES

WEAPON SYSTEM	S P O			A F P R O		
	MAILED	RETURNED	PERCENT	MAILED	RETURNED	PERCENT
C-5A	25	17	68%	18	13	72%
F-15	25	18	72%	27	25	93%
B-1	25	14	56%	20	13	65%
TOTAL	75	49	65.3%	65	51	78.5%

APPENDIX D

C-5A DATA

110

APPENDIX D

C-5A DATA

S P O					Question	A F P R O				
Yes 1	2	3	4	NO 5		Yes 1	2	3	4	No 5
1	6	0	0	10	1	5	1	1	0	6
11	0	0	1	5	2	8	2	1	0	2
10	2	3	0	2	3	6	2	4	0	1
4	1	4	1	7	4	5	3	2	0	3
3	2	2	1	9	5	5	2	1	0	5
8	2	6	0	1	6	7	2	0	1	3
8	2	5	1	1	7	5	4	4	0	0
2	5	6	1	3	8	5	5	2	0	1
9	1	2	3	2	9	9	2	0	2	0
7	1	2	2	5	10	9	3	0	1	0
8	4	1	0	4	11	6	5	0	1	2
2	5	3	2	5	12	8	2	2	0	1
2	2	1	0	12	13	3	2	3	1	4
2	1	4	2	8	14	0	2	1	4	6
3	0	3	0	11	15	0	0	2	0	11
6	1	8	1	1	16	7	2	4	0	0
8	1	5	0	3	17	5	1	4	0	3
7	2	4	0	4	18	2	2	6	1	3
5	4	7	1	0	19	8	4	1	0	0
16	1	0	0	0	20	11	1	1	0	0

APPENDIX E

F-15 DATA

113

APPENDIX E

F-15 DATA

Question	S P O				Question	A F P R O				No
	Yes 1	2	3	4		5	Yes 1	2	3	
4	0	2	1	11	1	5	3	0	0	28
13	1	1	0	3	2	19	0	2	1	3
9	4	4	0	1	3	14	5	2	2	2
4	1	3	2	8	4	5	2	9	3	6
8	3	2	1	4	5	9	2	5	0	9
4	3	5	0	6	6	12	3	6	3	1
9	2	3	0	4	7	7	4	12	1	1
10	2	4	0	2	8	15	2	4	1	3
13	2	2	0	1	9	11	5	5	1	3
14	2	1	0	1	10	12	3	2	4	4
12	4	0	1	1	11	8	5	5	1	6
7	7	4	0	0	12	11	6	4	1	3
2	1	2	1	12	13	0	3	2	1	19
2	1	4	1	10	14	7	4	3	4	7
2	1	7	1	7	15	2	4	4	4	11
10	2	4	0	2	16	15	2	6	1	1
2	0	7	2	8	17	8	2	6	3	6
6	4	5	0	3	18	10	7	7	1	0
6	2	8	1	1	19	10	1	11	2	1
16	1	1	0	0	20	16	4	4	0	1

APPENDIX F

B-1 DATA

115

APPENDIX F

B-1 DATA

S P O					Question	A F P R O				
Yes 1	2	3	4	No 5		Yes 1	2	3	4	No 5
4	0	2	1	11	1	5	2	0	0	18
13	1	1	0	3	2	19	0	2	1	3
9	4	4	0	1	3	14	5	2	2	2
4	1	3	2	8	4	5	2	9	3	6
8	3	2	1	4	5	9	2	5	0	9
4	3	5	0	6	6	12	3	6	3	1
9	2	3	0	4	7	7	4	12	1	1
10	2	4	0	2	8	15	2	4	1	3
13	2	2	0	1	9	11	5	5	1	3
14	2	1	0	2	10	12	3	2	4	4
12	4	0	1	1	11	8	5	5	1	6
7	7	4	0	0	12	11	6	4	1	3
2	1	2	1	12	13	0	3	2	1	19
2	1	4	1	10	14	7	4	3	4	7
2	1	7	1	7	15	2	4	4	4	11
10	2	4	0	2	16	15	2	6	1	1
2	0	7	2	8	17	8	2	6	3	6
6	4	5	0	3	18	10	7	7	1	0
6	2	8	1	1	19	10	1	11	2	1
16	1	1	0	0	20	16	4	4	0	1

## BIOGRAPHICAL SKETCHES OF THE AUTHORS

Captain Douglas D. Stormo is a native of Watertown, S.D. He received a Bachelor of Science Degree in Mechanized Agriculture, in 1967, from South Dakota State University. Captain Stormo was commissioned through the ROTC program. After attending the Aircraft Maintenance Officer School at Chanute AFB, Illinois, he was assigned to the 18th Fighter Interceptor Squadron at Grand Forks AFB, North Dakota. His next assignment is as a Production Officer at the Defense Contract Administration Region in Chicago, Illinois.

Captain James R. Heitz is a native of Buffalo, New York. He received a Bachelor of Arts Degree in Geography, in 1968, from the State University of New York at Buffalo. Captain Heitz was commissioned through the ROTC program. After attending the Aircraft Maintenance Officer School at Chanute AFB, Illinois, he was assigned to the 380th Organizational Maintenance Squadron at Plattsburgh AFB, New York. His next assignment is as an Aircraft Maintenance Officer at Eglin AFB, Florida.

AFIT  
WRIGHT-PATTERSON AFB. OH 45433

POSTAGE AND FEES PAID  
DEPARTMENT OF THE AIR FORCE

UNITED STATES AIR FORCE  
OFFICIAL BUSINESS

AFIT/SLGR  
Wright-Patterson AFB  
OHIO 45433

- Fold -

The student research conducted at this school builds, to a great extent, upon previous research efforts. Thus, your comments and/or criticism regarding this report are earnestly solicited. Please fold the completed sheet so the return address is visible for mailing. COMMENTS:

Tear Out

- Fold -

AFLC-WPAFB-FEB 71 1500