

MICROCOPY RESOLUTION TEST CHART
 NATIONAL BUREAU OF STANDARDS-1963-A

2
B.S.

ADA 038756

DEFENSE SYSTEMS MANAGEMENT SCHOOL



PROGRAM MANAGEMENT COURSE INDIVIDUAL STUDY PROGRAM

WHO MANAGES AIR FORCE
DEVELOPMENT AND ACQUISITION PROGRAMS?
STUDY REPORT
PMC 74-1

Bob D. Browning
Lt. Col. USAF

DDC
RECEIVED
APR 28 1977
A

AD No. _____
DDC FILE COPY

FORT BELVOIR, VIRGINIA 22060

BROWNING

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM								
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER								
4. TITLE (and Subtitle) 6 WHO MANAGES AIR FORCE DEVELOPMENT AND ACQUISITION PROGRAMS?		5. TYPE OF REPORT & PERIOD COVERED 9 Student Project Report, 74-1								
7. AUTHOR(s) 10 BOB D. BROWNING		6. PERFORMING ORG. REPORT NUMBER								
9. PERFORMING ORGANIZATION NAME AND ADDRESS DEFENSE SYSTEMS MANAGEMENT COLLEGE FT. BELVOIR, VA 22060		8. CONTRACT OR GRANT NUMBER(s)								
11. CONTROLLING OFFICE NAME AND ADDRESS DEFENSE SYSTEMS MANAGEMENT COLLEGE FT. BELVOIR, VA 22060		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 11 May 74								
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE 1974-1								
		13. NUMBER OF PAGES 58 12 61 p.								
		15. SECURITY CLASS. (of this Report) UNCLASSIFIED								
16. DISTRIBUTION STATEMENT (of this Report) UNLIMITED		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE								
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)										
18. SUPPLEMENTARY NOTES										
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) SEE ATTACHED SHEET		<table border="1"> <tr><td>SEARCHED</td><td>INDEXED</td></tr> <tr><td>SERIALIZED</td><td>FILED</td></tr> <tr><td colspan="2">JAN 73</td></tr> <tr><td colspan="2">FBI - MEMPHIS</td></tr> </table>	SEARCHED	INDEXED	SERIALIZED	FILED	JAN 73		FBI - MEMPHIS	
SEARCHED	INDEXED									
SERIALIZED	FILED									
JAN 73										
FBI - MEMPHIS										
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) SEE ATTACHED SHEET		<table border="1"> <tr><td>A</td><td></td><td></td></tr> </table>	A							
A										

410036

James

DEFENSE SYSTEMS MANAGEMENT SCHOOL

STUDY TITLE: WHO MANAGES AIR FORCE DEVELOPMENT AND ACQUISITION PROGRAMS?

STUDY GOALS: To determine the career characteristics of officers managing development and acquisition programs.

STUDY REPORT ABSTRACT

The development of program managers has been a topic of continuing interest within the Air Force and the Department of Defense. This report reviews previous studies and comments by high level officials to determine those experience, education, and training factors considered to be most relevant to program managers. To determine the extent to which these factors were contained in the backgrounds of officers currently managing Air Force programs, the development histories of 783 were examined. In general, these officers were found to have been well prepared through appropriate experience and education. However, the experience level of some managers of smaller programs was found to be low. Few of the officers examined had completed relevant training courses.

KEY WORDS: MATERIEL ACQUISITION PROGRAM MANAGEMENT OFFICER TRAINING
CAREER MANAGEMENT

NAME, RANK, SERVICE

CLASS

DATE

Don D. Browning, Lt. Col, USAF Class 74-1

May 1974

Form 1473A

WHO MANAGES AIR FORCE
DEVELOPMENT AND ACQUISITION PROGRAMS?

An Executive Summary
of a
Study Report
by

Bob D. Browning
Lt. Col. USAF

May 1974

Defense Systems Management School
Program Management Course
Class 74-1
Fort Belvoir, Virginia 22060

EXECUTIVE SUMMARY

This study examines the backgrounds of those officers who are managing Air Force development and acquisition programs in the Air Force Systems Command (AFSC). Management of these programs is a subject of high interest because of their cost and impact on national security. Of particular concern is whether the Air Force is entrusting the management of these programs to officers who have been properly prepared through experience, education, and training.

The review of previous studies and comments by senior managers indicates that several factors are considered to be very important in the development of military program managers. Most important is program management experience itself. This should be blended with assignments in the operational environment to enhance perception of user requirements and with assignments to Hq AFSC or Hq Air Force to provide a broad understanding of the decision-making processes. Education in technical and management academic areas is considered very important. Professional Military Education is also recommended to enhance career progression. In addition, specialized training in areas directly related to program management has been stressed. The effectiveness of these various factors with regard to individual program managers is dependent upon the

judgement of the viewer. Such an assessment was considered to be beyond the scope of this study.

No one optimum career pattern was identified for developing program managers. A career planning philosophy is followed in the Air Force which identifies broad guidelines of factors which appear to be most relevant. Careers are structured within these guidelines to enhance innate management ability with the experience and tools needed to operate effectively within the program management arena. This study measures the degree to which current program management personnel possess the experience, education, and training previously identified as preferable.

Four categories of program management officers were examined. The first three were managers of programs at differing levels of importance. The fourth category included complete System Program Offices. Data on these categories was analyzed for the three different program importance levels as well as by acquisition subcommand. In all, the careers of 783 were examined--estimated to be about one-fourth of the officers assigned to SPOs in AFSC.

The study found acquisition management experience to be very high in most cases. It averaged more than 11 years for managers of the major programs and an average of almost 6 years for all officers examined. However, managers of some of the

smaller programs appeared to have very low experience levels. A number of these officers had had no acquisition management experience prior to their current assignment. About two-thirds of all officers examined had operational experience and about 12 percent had had assignments to Hq AFSC or Hq USAF.

There was very good correlation found to exist between the academic backgrounds and that considered most relevant. At the undergraduate level, 80 percent had degrees in technical and 14 percent had degrees in management disciplines. Over 60 percent had Master's degrees in these disciplines. The overall level of academic education was considerably higher than other Air Force officers. This group also had a higher level of completion of professional military education courses than other Air Force officers.

There is no standard against which to measure the training level of these officers. However, less than 20 percent had completed one of the courses directly related to program management. This method could be used more extensively to help prepare the junior or inexperienced officers for program management responsibilities.

WHO MANAGES UNITED STATES AIR FORCE
DEVELOPMENT AND ACQUISITION PROGRAMS?

STUDY REPORT

Presented to the Faculty
of the
Defense Systems Management School
in Partial Fulfillment of the
Program Management Course
Class 74-1

by

Bob D. Browning
Lt. Col. USAF

May 1974

ACKNOWLEDGEMENTS

Many thanks to the Defense Systems Management School and staff for providing the opportunity for the pursuit of this study. Sincere thanks to the personnel in the Command Records Branch and in the office of the Assistant for Senior Officer Management at Hq Air Force Systems Command for their diligent assistance in researching officer military records.

Contents

Executive Summary	ii
Acknowledgements	vi
List of Figures	viii
List of Tables	ix
Chapter I - Introduction	1
Introduction	1
Air Force Program Management	3
Scope	4
Summary	5
Chapter II - Desirable Characteristics for Program Manager	
Career Planning	6
Air Force Career Planning	6
Previous Studies	7
Comments by Senior Managers	9
Summary	10
Chapter III - An Overview of Factors Related to the	
Development of Air Force Program Managers	11
Chapter IV - Data Collection	14
Source of Data	14
Academic Education	14
Professional Military Education	15
Training	16
Experience	16
Summary	17
Chapter V - Data Analysis	19
Military Grade Level	19
Aeronautical Rating	20
Acquisition Management Experience	21
Operational Experience	24
Headquarters Experience	25
Academic Education	25
Professional Military Education	28
Training	30
Chapter VI - Summary	32
Bibliography	36
Appendix A - Data Tables	37

List of Figures

<u>Figure</u>		<u>Page</u>
1	Average Military Grade	19
2	Aeronautical Rating	21
3	Acquisition Management Experience (Total)	22
4	Acquisition Management Experience (w/o Lts)	23
5	Operational Experience	24
6	Headquarters Experience	25
7	Education (Undergraduate)	26
8	Education (Master's)	27
9	Combination Technical/Management Education	28
10	Professional Military Education	29
11	Training	30

List of Tables

<u>Table</u>		<u>Page</u>
1	PAR Program Directors	39
2	CAR Program Directors	40
3	Managers of Non PAR/CAR Programs	41
4	PAR Program Office Personnel	42
5	CAR Program Office Personnel	43
6	Non PAR/CAR Program Office Personnel	44
7	ADTC Program Office Personnel	45
8	ASD Program Office Personnel	46
9	MSD Program Office Personnel	47
10	SAMSO Program Office Personnel	48
11	Summary--All Officers Included in Study	49

WHO MANAGES AIR FORCE
DEVELOPMENT AND ACQUISITION PROGRAMS?

CHAPTER I

Introduction

Introduction

The purpose of this study is to determine the relevant career characteristics for those military officers who are managing development and acquisition programs in the Air Force Systems Command (AFSC). Management of these programs is the major activity of this Command and accounts for over six billion dollars annually, about 22 percent of the entire Air Force budget.

Because of this high dollar value and the direct affect upon our future national security, the development and acquisition of military systems has been a subject of continuing interest to numerous special study groups and to key government officials. In a November 1969 Memorandum, former Deputy Secretary of Defense, David Packard, stated, "A major challenge that the Department of Defense faces is to improve the execution of our weapon system acquisition programs. An essential step in

*ABSTAINER

This study represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management School nor the Department of Defense.

realizing this objective is to assign gifted and experienced individuals to the positions which direct or influence significantly the acquisition programs."¹ Visiting program managers and distinguished guest speakers at the Defense Systems Management School (DSMS) during the conduct of Program Management Course 74-1 have reiterated the vital importance of properly qualified people to the successful conduct of military program management activities. In fact, the establishment of DSMS itself was aimed at the problem of providing improved program managers. During the opening ceremonies for the first class, Mr. Packard stated that DSMS "has been established for the specific purpose of making a substantial improvement in the capability and effectiveness of managers for the important development and production programs of the Department of Defense."² This same concern was also expressed by Secretary of Defense Clements when discussing program managers at a Joint Logistics Commanders Conference when he said "that he wanted DoD people to emphasize training, career patterns, background, and management."³

¹Packard, David. "Career Speciality in Development Project Management," Deputy Secretary of Defense MEMORANDUM FOR Secretaries of the Military Departments, 25 November 1969.

²Opening address to the first Program Management Course, DSMS, by Deputy Secretary of Defense David Packard, 3 May 1971.

³Memorandum for Mr. Mendolia from Hugh E. Witt, OSD, Subj: Meeting With Secretary Clements Regarding Project Managers, 21 November 1973.

Air Force Program Management

Program management is the process of integrating the activities of all participating organizations, including government and private industry, to meet program objectives. This has been a part of the Military Services' approach to the development and acquisition of military systems, in varying degrees, for over 30 years. Within the Air Force, this management endeavor is exercised primarily within AFSC which is responsible for the development and acquisition of new systems. There are many System Program Offices (SPO) in AFSC which are the management focal points for all the efforts to bring a new system into the operational inventory. These SPOs vary in size from over two hundred to one or two people, depending upon the size, complexity, and importance of the program.

The Air Force has long recognized the need for professional competence in manning system acquisition programs. In 1964 a separate officer career field was established to provide a focus for the development and utilization of system program managers. The personnel management of this career field is designed to provide a resource of officers who have been prepared through appropriate assignments, education, and training to fill key acquisition management positions. It is toward these characteristics of the people who are currently assigned to SPOs that this study is directed.

Scope

Programs managed by the personnel whose careers were examined during this study ranged from major systems costing several billion dollars to smaller programs involving only a few million dollars. To provide a broad data base, four groups of officers were reviewed. The first group consisted of the managers of the ten highest priority programs--those which the Commander of AFSC had designated for personal review each month. These are known as PAR (Program Acquisition Review) programs and include such major systems as the B-1, F-15, and Minuteman. The Chief of Staff and Secretary of the Air Force also review these programs on a monthly basis.

Managers of CAR (Command Acquisition Review) programs made up the second group. These programs are reviewed by the Commander of AFSC on a quarterly basis and are exceeded in level of importance only by the PAR programs. Some programs in the CAR category are ABRES, C-5A, F-4, Maverick, and TRI-TAC.

The third group consists of managers of identifiable programs other than PAR or CAR programs. Because there is no standard definition of what level of effort warrants the designation of a development and/or acquisition management task as a "program", this group of managers is not all inclusive. However, in the aggregate, an analysis of their relevant career characteristics should be representative of the military

personnel managing programs below the PAR/CAR level.

To gain a composite profile of the officers in a typical SPO, all military personnel assigned to several randomly selected programs were examined. These include PAR, CAR, and non-PAR/CAR programs in all four AFSC acquisition sub-commands --the Aeronautical Systems Division, the Electronic Systems Division, the Space and Missile Systems Organization, and the Armament Development and Test Center. Officers in this fourth group include many in specialties other than System Program Management (Air Force Specialty Code 29XX). The careers of all officers assigned to the SPO were examined. This included some in Scientific (26XX), Research and Development Management (27XX), Development Engineering (28XX), Communications-Electronics (30XX), Weapons Controller (17XX), Procurement (65XX), Logistics (66XX), and Financial Management (67XX) specialties.

Summary

Management of development and acquisition programs for military systems is a subject of critical importance to the Air Force and the Department of Defense. The successful conduct of these programs is heavily dependent upon the capability of the people charged with their management. By analyzing a large sample of officers assigned to a broad spectrum of programs within AFSC, this study determines which of the relevant characteristics have been included in the careers of the current group of program managers.

CHAPTER II

Desirable Characteristics for Program Manager Career Planning

There is no one optimum career pattern for a program manager. Each program has its own special problems and areas for concern. For this reason the Air Force career development program is structured within broad guidelines of the factors which appear to be the most applicable to program management. These guidelines have been constructed based upon studies which have identified needed skills and upon the opinions expressed by experienced program managers. A career planning philosophy is followed which builds functional generalists within the relatively narrow functional areas closely related to the R&D and acquisition management. Assignment or training outside these areas is a planned, deliberate action to provide complementary knowledge or skills or to meet a critical Air Force requirement for other skills possessed by an individual officer (for instance, pilots and navigators needed in crew positions).

Air Force Career Planning

The Air Force Officer Career Progression Guides⁴ for R&D and program management personnel emphasize four principal considerations for career planning. An assignment pattern is

⁴Air Force Manual 36-23, Officer Career Management, 30 June 1972.

stressed which will provide experience and understanding of technical, program management and operational activities. Graduate education is encouraged and, for some scientific and engineering specialties, is considered essential due to the uniqueness of the tasks performed. Completion of professional military service schools is highly desirable for career officers. Attendance at technical courses is important to the development of functional specialties. The normal pattern for career development of these officers includes broadening experience through a series of complementary assignments, academic specialization and graduate education, professional military education, and technical courses.

Previous Studies

In November 1970, the Deputy Chief of Staff for Personnel, Hq AFSC, completed a report based upon the results of a survey questionnaire answered by 91 AFSC General Officers, System Program Directors, and key program management personnel.⁵ The purpose of this questionnaire was to determine those experience, education, and training factors which were considered to contribute significantly to the development of successful program managers. In summary, the strongest opinions of these senior officers (O6 and above) were that a program manager:

⁵A Systems Analysis by Deputy Assistant for Senior Officer Management DCS/Personnel, Hq AFSC, November 1970, "The Systems Program Manager of the Seventies".

1. Should have a breadth of experience. In order of priority, this includes: (Note: Only those factors which relate to the current study have been listed)

- a. Previous SPO experience.
- b. Hq USAF/Hq AFSC staff experience.
- c. Operational experience.
- d. R&D test center or laboratory experience.

2. Should preferably have at least a BS in engineering. A MS is desirable--preferably a MS or MBA in management.

3. Should have professional military education through the senior school level.

4. Should attend a special SPO training course such as the Defense Weapon System Management Course (predecessor to the Program Management Course of the Defense Systems Management School).

Versions of the above factors have been emphasized by other groups and individuals in commenting upon the development of program managers. In its 1970 report, the Blue Ribbon Defense Panel⁶ indicated that a program manager should have preparatory experience in managing technical programs. In addition, they should have operational tours to provide a full appreciation of the operational requirements and environment. More recently (March 1974) the results of a questionnaire to senior officers

⁶Blue Ribbon Defense Panel, Staff Report on Major Weapon Systems Acquisition Process, Report to the President and the Secretary of Defense of the Department of Defense, Washington, D.C., July 1970.

in Air Force Systems Command has reiterated the importance of the above listed factors in preparing officers for positions of key responsibility in program management.

Comments by Senior Managers

In October 1973 remarks at the Defense Systems Management School,⁷ Assistant Secretary of Defense Clements stated:

Competent Program Managers are needed more than ever. We must have qualifying selection criteria. The Command of a battalion, a ship, or an airplane squadron does not necessarily insure success of a Program Manager. Program management experience itself is essential. This experience must be supplemented with professional education, such as this course that you are taking.

In other words, general leadership or management ability alone is not sufficient to provide good management of complex defense acquisition programs. Specific expertise that comes from "hands-on experience" and augmented by especially oriented training programs is essential. Vice Admiral Rickover expressed this same belief during testimony before a Congressional Subcommittee:⁸

⁷ Remarks delivered by the Honorable William P. Clements, Jr. to the Students of the Program Management Course and the participants of the first General/Flag Orientation Seminar on Systems Acquisition Management, Defense Systems Management School, Fort Belvoir, Virginia, October 16, 1973.

⁸ Hearing before the Subcommittee for the Department of Defense of the House Committee on Appropriations for 1973, 10 May 1972.

The Navy's belief is that a good military man without prior technical expertise can run a weapons project. In military hospitals, on the other hand, the Armed Forces insist that control be exercised only by trained physicians. This is because Defense officials are unwilling to take risks on medical care, where life and death are at stake. Why is not the same attitude taken toward complex technical projects such as the development of ships, airplanes, or weapons systems? Where personnel health is concerned, we insist that those in charge be qualified through training and experience. Why do we not insist that where the health of our Nation is concerned, those in charge of complex technical projects be likewise qualified through training and experience? . . . It takes years of training and experience to develop an officer who is capable of being in charge of a major program . . .

Summary

Based upon these previous studies and remarks by knowledgeable senior managers, this report examines the following characteristics of officers managing development and acquisition programs in AFSC:

1. Acquisition management experience.
2. Operational experience.
3. Hq USAF/Hq AFSC staff experience.
4. Academic education.
5. Professional military education.
6. Specialized program management training.

CHAPTER III

An Overview of the Factors Related to the Development of Air Force Program Managers

For purposes of analysis, the development of Air Force program managers could be related to the job of designing, developing, and testing an item to accomplish a specific task. In fundamental terms of operating an effective career development program for program managers, this simply implies that it is desirable to design guidelines for developing potential program managers, and to be able to evaluate the impact of various career alternatives, policy changes, or deviations from the established guidelines. However, as noted in Chapter II, there is no one optimum career pattern for developing a good program manager. Not only is it impossible to accurately predict the particular problems which unknown future programs may encounter, it is also not possible to forecast the management abilities of specific individuals until they have been tested under the stress of progressively difficult and complex management situations.

Because of the uncertain nature of defense program management, it is very difficult to measure the contribution of specific individuals to the existence of a successful or unsuccessful program. Certainly, the ultimate success of a particular defense program depends heavily upon many circumstances other

than the effectiveness of its internal management; for example, validity of the operational requirement or stability of the threat, the tolerance of national budget makers, the social environment, or the priority of competing programs. Therefore, the connection between program success and the effectiveness of its managers (and, hence, their particular career patterns) is, at best, tenuous. For this reason, a measure of effectiveness for an individual manager is extremely difficult and, in most cases, depends upon the subjective judgement of an observer. Such a measure is beyond the scope of this study.

The Air Force cannot build an officers' innate ability to manage; but, it can enhance any inherent ability by insuring that potential program managers receive a background which is most applicable to the management environment for the types of systems to be managed. Based upon the studies which have been conducted and the opinions expressed by knowledgeable people, it can be reasonably stated that certain kinds of experience, education, and training seem to be most valuable even though their specific order of importance cannot be agreed upon. The degree to which officers in program offices possess these background characteristics is then somewhat a measure of the effectiveness of Air Force assignment, selection, education, and training policies in the program management career areas. The remainder of this report concentrates upon a quantitative

measure of the background characteristics of officers involved in program management at the SPO level.

It is fully recognized that there are jobs at other organizational levels which also require officers with these same qualifications--for instance, staff support of SPOs in each product division, staff positions in Hq AFSC and Hq USAF, Air Force Plant Representatives Offices, and positions within OSD and various Defense Agencies. This report will address only the frequency of occurrence of these characteristics among officers who are currently working in the SPOs.

CHAPTER IV

Data Collection

Source of Data

The data presented in this report was extracted from the personnel records maintained by the AFSC. A primary source of data was the official Command Personnel Records Group maintained by the Deputy Chief of Staff for Personnel, Hq AFSC. These records provide a complete military history, including academic education, professional military education, training, and assignments. Most of this information is also included in the Personnel Data System and this source, in the summary form of an Officer Career Brief (AF Form 293-1), was used as an initial screening tool. For many officers, however, it was also necessary to manually review their Command Records Group to obtain complete information. Summary data on all AFSC officers was obtained from Hq AFSC Report PCN C6580B, Qualitative Analysis--Line Officer Force. Data on the characteristics of Air Force officers was obtained from Air Force Military Personnel Center Report, RC5 PMC-P760, Officer Force Characteristics.

Academic Education

Previous studies had indicated that technical and management academic disciplines were most applicable to the job of Air Force program management. For purposes of this study, technical means education in the physical sciences, engineering,

or mathematics academic fields. Degrees from the military academies were also categorized as technical except in those cases of the more recent graduates of the Air Force Academy where the records indicated an academic major in another area such as History, Psychology, or Political Science. In the data tables, the management category includes not only all types of degrees in the management academic field; but, also degrees in Economics. Because previous studies had also indicated that possession of academic education in both the technical and management areas would better equip an officer to handle the broader aspects of program management, the number of officers who had this desirable combination was also noted. Any combination, at either the graduate or undergraduate level, was recorded.

Professional Military Education

Professional Military Education (PME) is divided into three levels. At the initial level is Squadron Officers School which is available, in residence, to officers in their second through eighth years. There are several intermediate level PME courses. Most Air Force officers attend either the Air Command and Staff College or Armed Forces Staff College although some do attend intermediate level schools in the Army, Navy, or other nations. Attendance at these schools is available to Majors and Major-selectees. Schools at the senior level are available for attendance by Lieutenant Colonels and Lieutenant

study were those EWI options which provide training in cost analysis, financial management, procurement management, research management, and quality assurance in the aerospace industry. All these courses are of at least 10 months duration.

The AFIT School of Systems and Logistics has conducted a System Program Management Course since 1964. This course is currently 33 days long and provides a review of management areas specifically of concern in SPOs. Included are DoD and Air Force policies and procedures, current management issues, financial management, configuration control, logistics support, testing, and procurement. This course is oriented towards Air Force program management and is attended by Air Force officers in the grades of Lieutenant through Lieutenant Colonel.

The 20-week DSMS course provides more in-depth training than the AFIT course in all areas of system program management. It addresses the broader problems of program management in the Department of Defense and is attended by officers from all three Military Services in the grades of Major and Lieutenant Colonel (or Navy equivalent). A similar course is conducted at the Navy Postgraduate School; but, none of the officers reviewed had attended this course.

Experience

Five different categories of assignment experience were considered relevant to this study: (1) system program management, (2) R&D management, (3) operational, (4) Hq AFSC, and

(5) Hq USAF. In addition to assignments to SPOs, time spent in Air Force Plant Representative Offices and plant offices operated by the Defense Contract Administration Agency were considered to contribute system program management experience. The primary sources of R&D experience were assignments to AFSC laboratories and test centers. For purposes of this study, operational assignments were considered to be those in which the immediate object is the accomplishment of a military mission. Included were operation of aircraft or missile systems, maintenance of equipment, logistics support of deployed systems and operational test and evaluation. Time spent in assignments to Hq AFSC and Hq USAF was also categorized as R&D because the jobs at these levels usually address the broader aspects of the R&D program administration rather than just system programs. Only the fact that an officer had had experience in the operational environment, at Hq AFSC, or at Hq USAF was recorded, not the amount of time spent in these activities. The accumulation of time in R&D and system program management activities was recorded to provide an indication of the total acquisition management experience level of officers managing current programs.

Summary

In all, the records of 783 officers assigned to AFSC SPOs were reviewed. These included 10 directors of PAR programs, 30 directors of CAR programs, 55 managers of smaller programs,

and 703 officers assigned to selected SPOs. (Note, these various categories add to more than 783 because there is some overlap.) In this latter category were programs at all four AFSC acquisition subcommands (Aeronautical Systems Division, Armament Development and Test Center, Electronic Systems Division, and the Space and Missile Systems Organization). Included were 4 PAR programs, 11 CAR programs, and 7 others.

CHAPTER V

Data Analysis

Data collected on the program management personnel reviewed in this study is provided in Appendix A.

Military Grade Level

Figure 1 shows the average military grade of the various categories of personnel reviewed in this study. Reasonably, the grade level of the various categories of managers is higher than that for entire SPOs. The average grade level of SPO personnel is very close to that for the entire command.

Average Military Grade

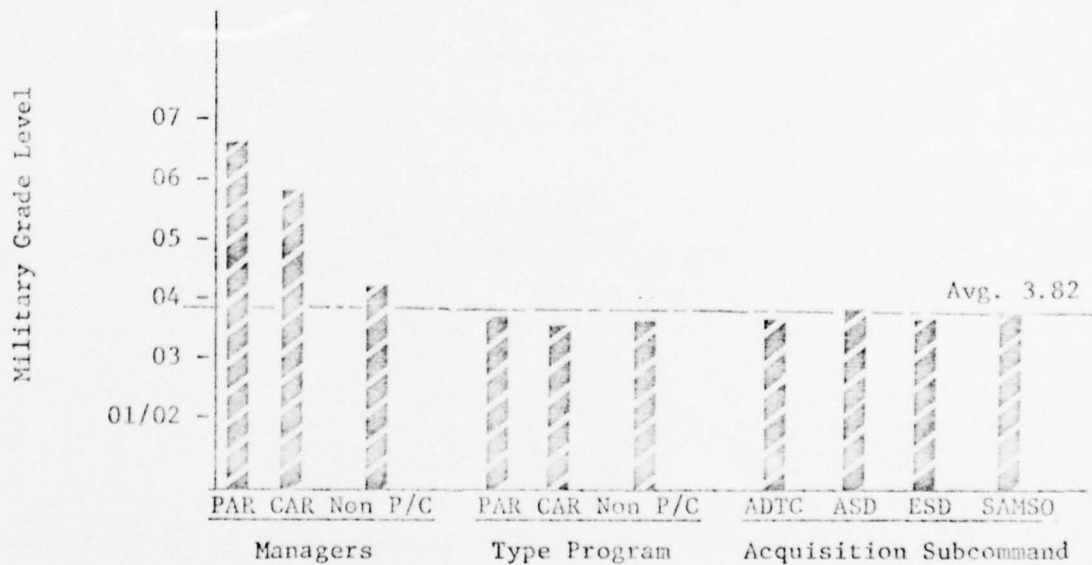


FIGURE 1

Aeronautical Rating

A basis for much Air Force personnel planning is aeronautical rating. Those officers with an aeronautical rating, principally pilot or navigator, are a closely controlled resource because of the high cost of their training. Historically, selection rates for regular commissions, promotions, and professional military schools has been biased in favor of those officers with an aeronautical rating--primarily pilots. Therefore, the distribution of rated officers in SPOs can be an indicator of the Air Force perceived value of this career area and, also, as a predictor of future career success for these officers. Figure 2 indicates that the number of program managers who are also pilots or navigators is considerably higher than the Command average. In part, this can be explained by the higher proportion of pilots and navigators at the higher grade levels. For instance, 54 percent of the Majors, 84 percent of the Lieutenant Colonels, 88 percent of the Colonels, and 76 percent of the Generals in AFSC are rated.

Aeronautical Rating

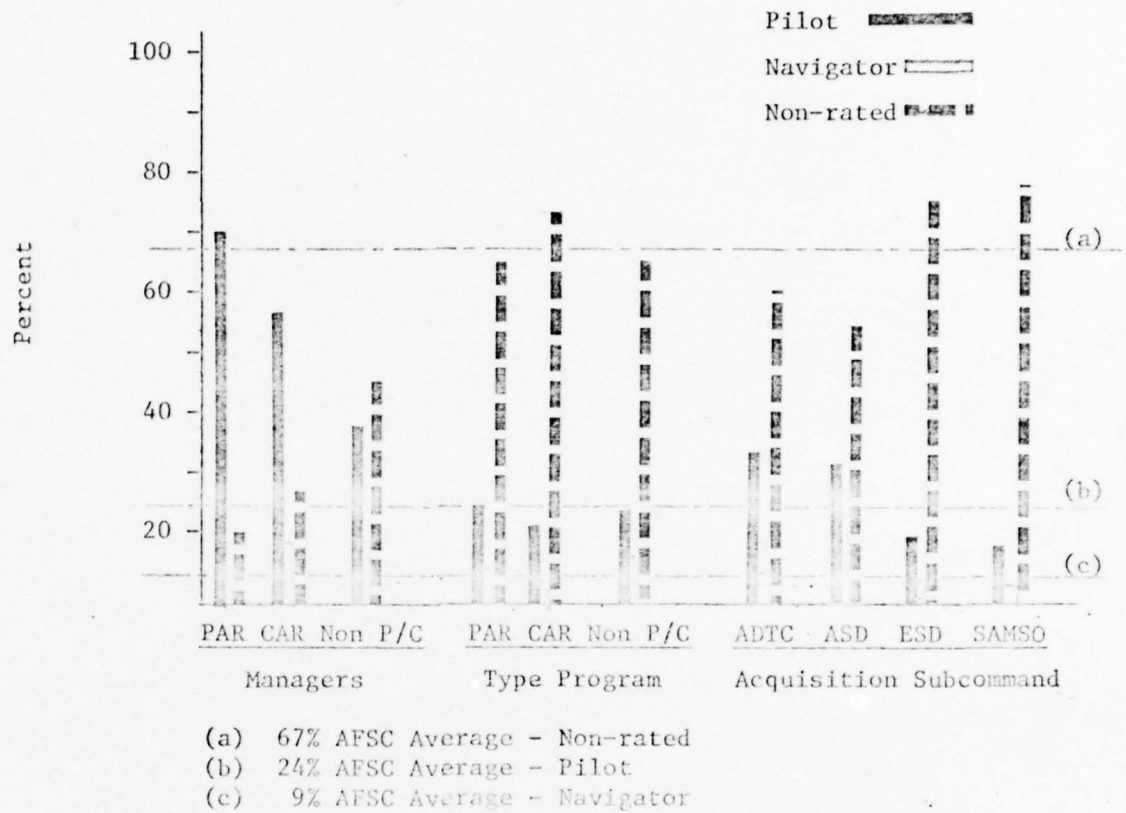


FIGURE 2

Acquisition Management Experience

Figure 3 shows the average number of years experience accumulated in R&D and SPO assignments. This acquisition management experience averaged 6.1 years for all the officers included in this study. Managers of the PAR and CAR Programs had a higher experience level than did managers of the lesser priority programs below the PAR/CAR level.

Acquisition Management Experience (Total)

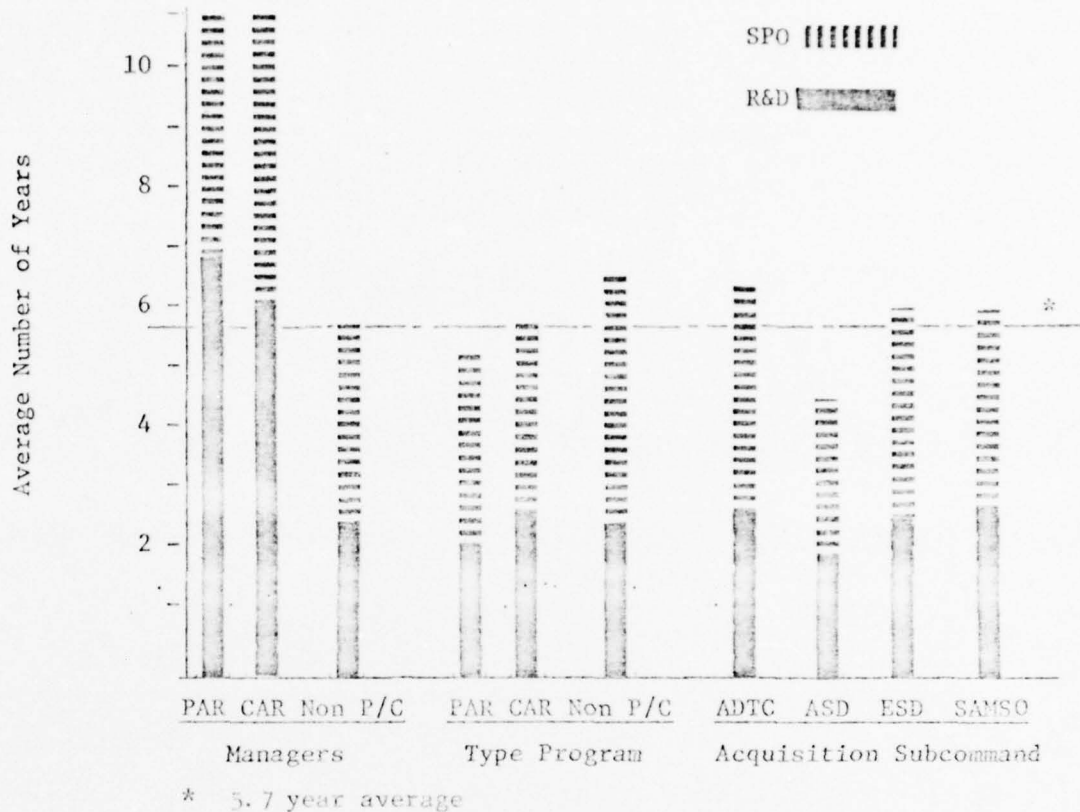


FIGURE 3

Within the acquisition subcommands, only ASD appears to deviate appreciably from the overall average. A possible explanation for this is the fact that ASD SPOs rely upon a separate functional organization to provide most of their engineering support. In other SPOs this tended to be a high experience area.

The experience levels in the various categories of program offices shows an increasing trend from the high priority PAR programs to the low priority programs below the PAR/CAR level. SPOs for PAR and CAR programs tend to be more nearly

self-sufficient and, therefore, larger. Their manning depth better enables them to absorb less experienced people than the smaller SPOs where there is a dependence upon an experienced cadre to direct the supporting efforts of functional organizations. An examination of the key personnel in the PAR and CAR SPOs shows a very high experience level among this group--an average of 9 years.

Figure 4 shows the experience levels with assigned Lieutenants excluded. Because these officers are clearly in an apprentice status, this gives a more accurate portrayal of the experience level of those officers who would be carrying essentially all the management responsibility.

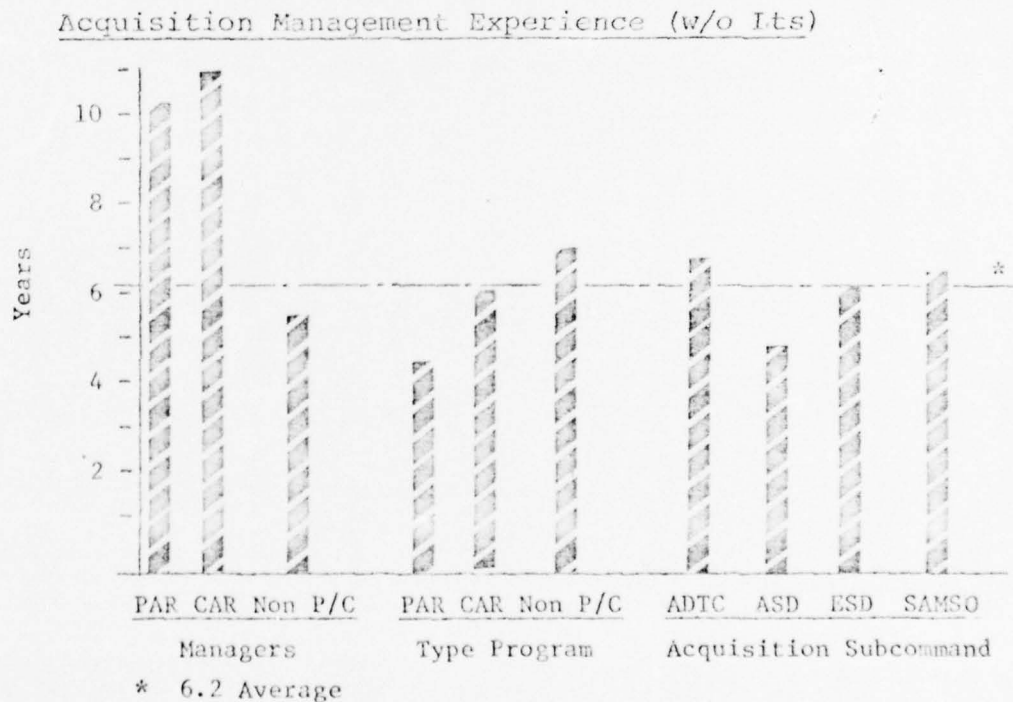


FIGURE 4

The data in Figure 1 indicates an average grade level of just under Major for the officers included in this study. This relates to an average of between 11 and 12 years of active commissioned service. When combined with Figure 3, this indicates that, on the average, the officers assigned to AFSC SPOs have spent just under half their total career in acquisition management.

Operational Experience

About two-thirds of the officers reviewed in this study had had experience in the user environment of the Air Force. The rated officers accounted for half of this operational experience; however, over half the non-rated officers had also had assignments in the operational environment. There was no particular significance attached to the distribution of this experience shown in Figure 5.

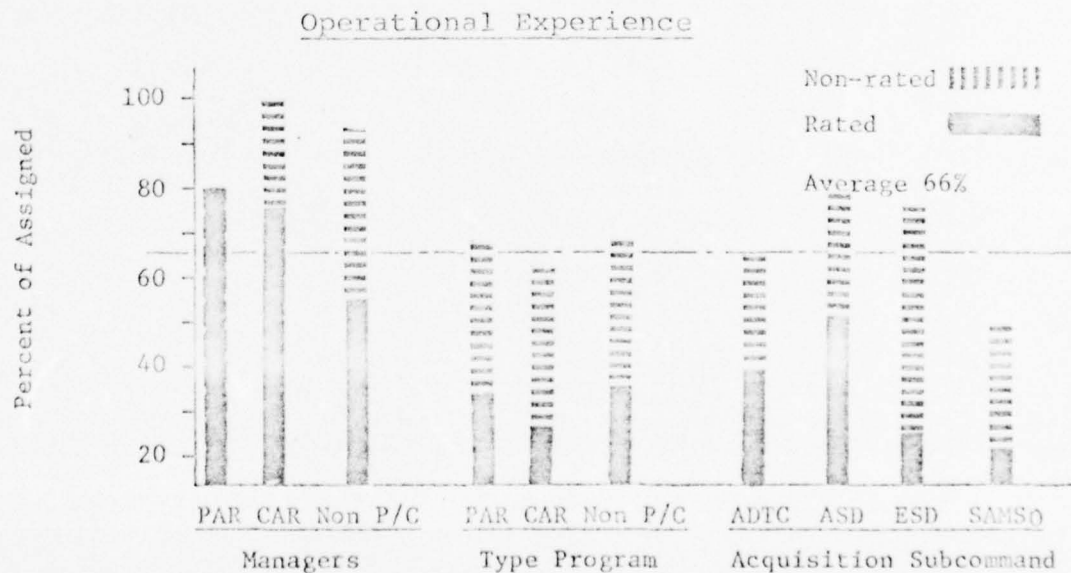


FIGURE 5

Headquarters Experience

About 11 percent of the officers had had assignments at either Hq USAF or Hq AFSC. Figure 6 shows the distribution of this experience. Almost half the PAR and CAR program directors had had tours at one of these headquarters and 15 percent had had tours in both. Overall, 6.5 percent of the officers in this study had Hq AFSC experience and 4 percent had Hq USAF experience.

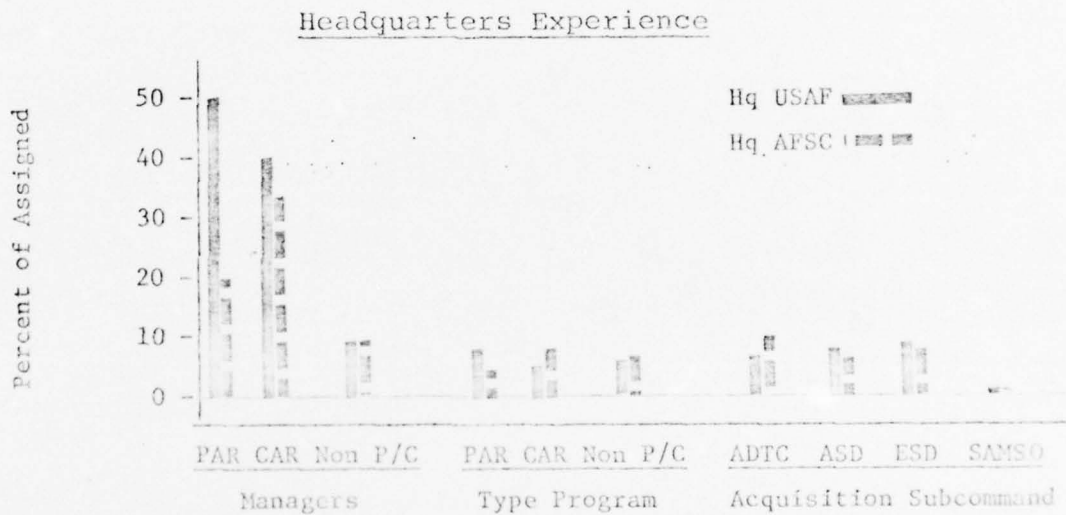


FIGURE 6

Academic Education

Academic qualifications are shown in Figure 7, 8, and 9. All officers included in this study had at least an undergraduate degree; however, not all had degrees in either the technical or management areas which had been indicated as most applicable in previous studies.

A technical degree has been clearly a strong prerequisite in selecting personnel for SPOs. All the PAR and CAR managers have technical undergraduate degrees. Almost all, 84 percent, of the other program managers had technical degrees. Predominantly (79 percent) technical degrees were also held by other SPO personnel. Overall, at the undergraduate level, 80 percent of the officers had a technical and 14 percent had a management academic background.

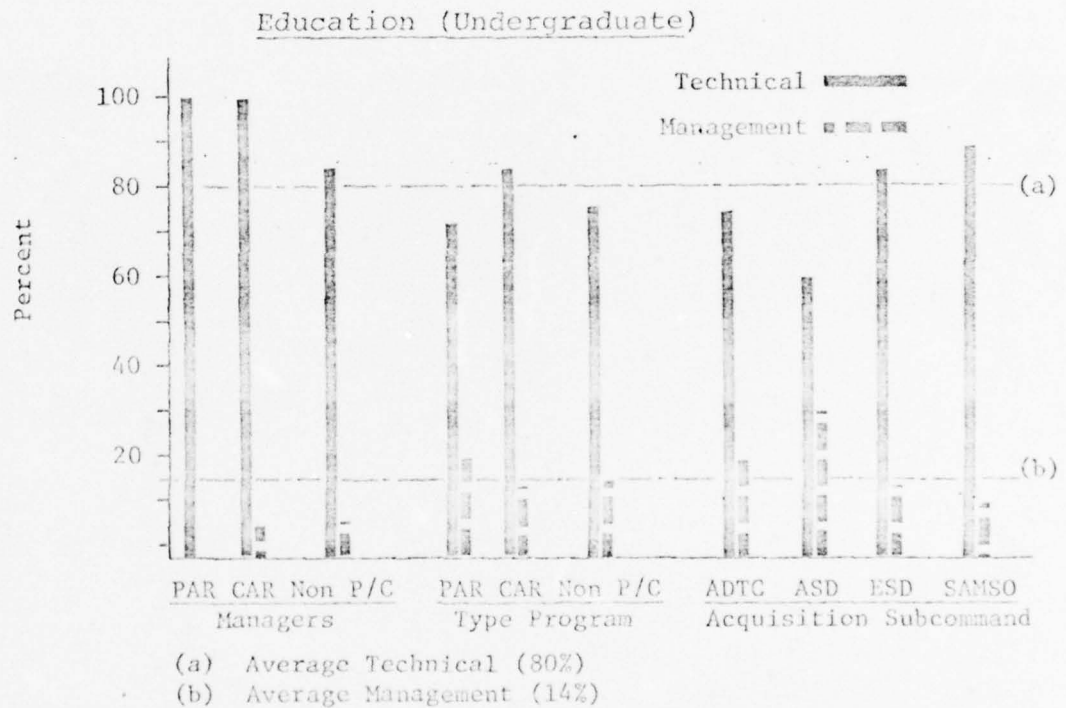


FIGURE 7

At the Master's level, the data in Figure 8 shows a definite shift toward management--27 percent of all officers surveyed.

Another 35 percent had Master's degrees in technical disciplines. Of the 783 officers reviewed, 61 percent had Master's degrees in technical or management disciplines--13 officers had both technical and management Master's degrees. An additional 20 officers also had Ph.D. degrees in technical disciplines, including 5 of the PAR and CAR program managers. Of these senior program managers, 85 percent had Master's and 13 percent had Ph.D. degrees, as compared to 61 percent and 3 percent for the other officers. The comparable averages for all officers in AFSC are 49 percent and 5 percent. For the entire Air Force, these averages are 18 percent and 1 percent, respectively, for line officers.

Education (Master's)

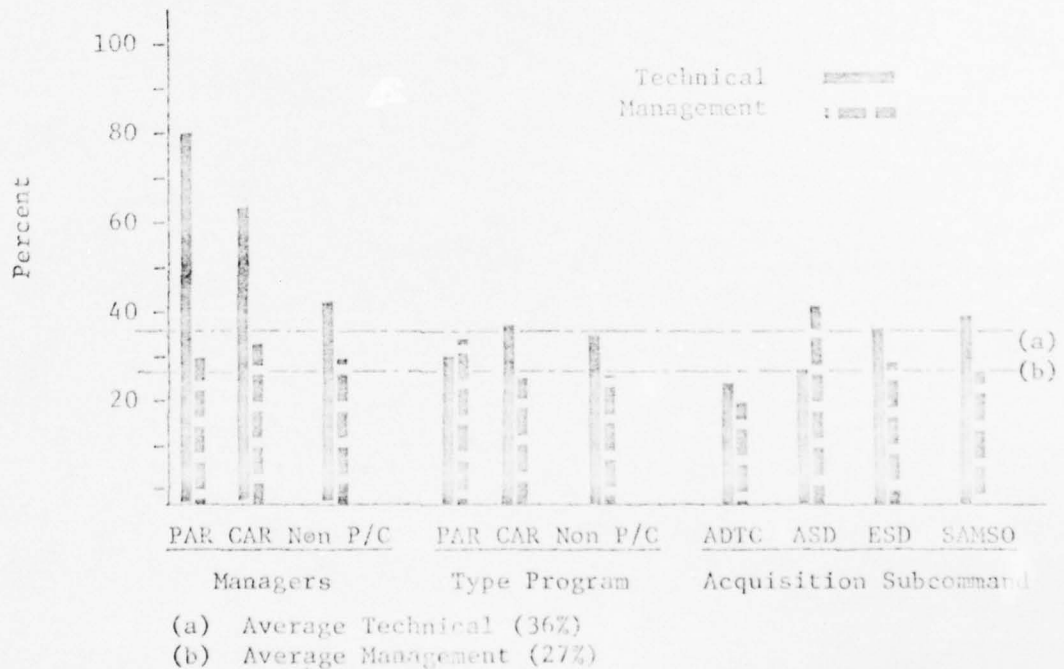


FIGURE 8

The other educational area of interest in previous studies concerned a combination of technical and management academic backgrounds. In all, 24 percent of these officers had this academic combination, mostly with a technical Bachelor's degree and management Master's degree. No significant trends were detected between the various categories of officers.

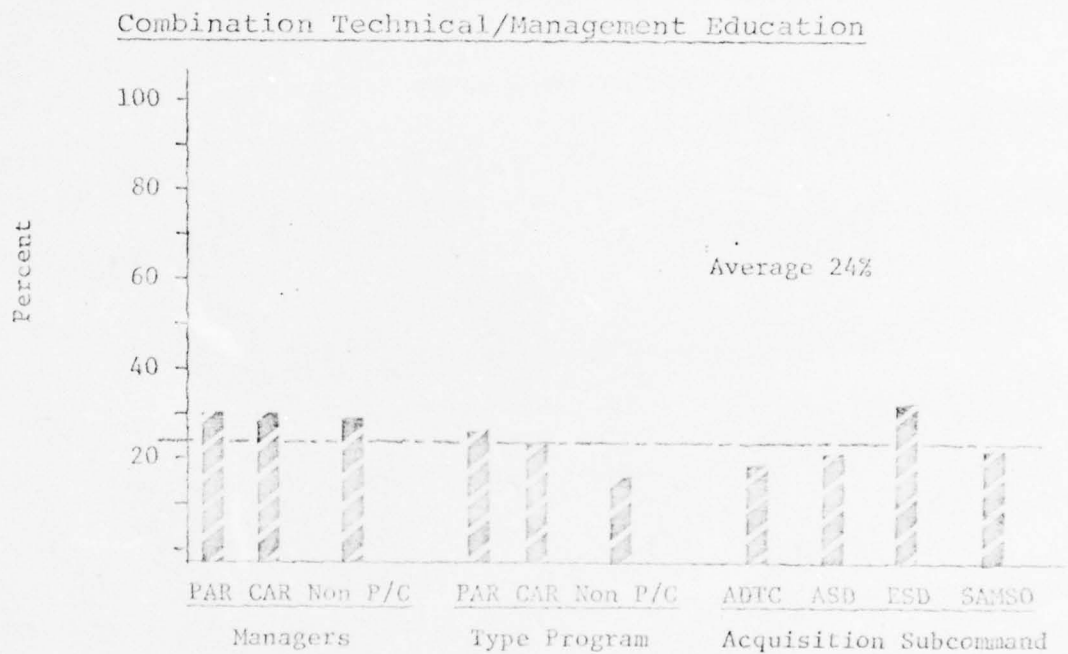


FIGURE 9

Professional Military Education

Figure 10 shows the percentage of officers included in this study who had completed the three different levels of PME. The following table provides a comparison with all AFSC and Air Force officers.

	<u>This Study</u>	<u>AFSC</u>	<u>Air Force</u>
SOS	47%	41%	34%
ISS	36%	25%	21%
SSS	43%	31%	31%

The program management personnel in this study had appreciably higher completion rates than other officers in either the rest of AFSC or the Air Force.

Professional Military Education

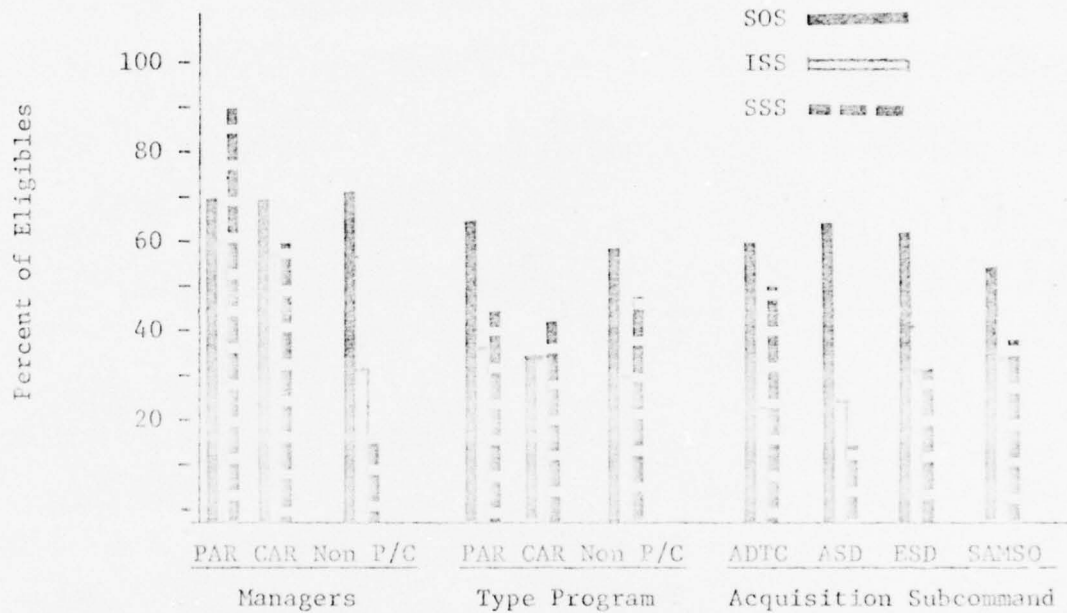


FIGURE 10

All program managers had higher completion rates for SOS than other program office personnel. The PAR and CAR program managers also had appreciably higher completion rates for intermediate and senior level schools.

Training

The number of personnel who had completed any of the specialized training courses was relatively low. Only 74 of these officers had completed the System Program Officer Course conducted by AFIT. There were 17 officers in this study who had completed DSMS or its predecessor, The Defense Weapons System Management Course. A total of 62 officers had completed EWI programs.

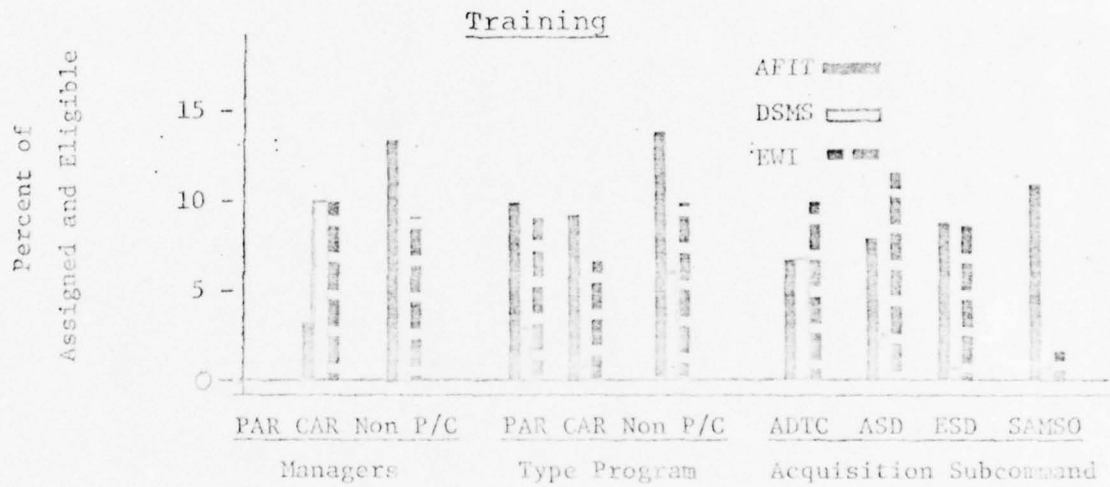


FIGURE 11

None of the PAR program managers had completed any of these training courses. However, three of these managers had completed the Harvard Advanced Management Course.

Both managers of Non PAR/CAR programs and personnel assigned to these program offices had the highest attendance rates at the AFIT course. With the exception of SAMSO SPOs, the EWI trainees

were spread fairly evenly. There are so few DSMS/DWSMC graduates at this time, that analysis of their distribution is not meaningful.

CHAPTER VI

Summary

The Air Force appears to be manning its program offices with officers who have a blend of the characteristics which previous studies have considered most applicable to program management. As stated in Chapter II, there is no optimum career path or standard against which these factors can be compared. Therefore, any assessment regarding adequacy or inadequacy is highly subjective.

Experience in the acquisition business is clearly considered to be the most important single asset which a program manager can have. In this respect, the selection of PAR and CAR program managers appears to have been strongly guided by this characteristic. On the average, these managers of major programs have more than 11 years experience in managing acquisition programs. The experience range was from 3 to 20 years for PAR program managers and from 4 to 23 years for CAR program managers. Ninety-five percent of the PAR managers had 7 or more years of acquisition management experience and, further, 70 percent had previously been managers or deputies for major programs. Of the CAR managers, 95 percent had 5 or more years of acquisition management experience.

Managers of programs below the PAR/CAR level had considerably less acquisition management experience than did managers

of the major programs. This is not a surprising finding. It should be expected that managers with the greater experience would be assigned to the programs of highest importance. However, what was surprising was that these managers had a lower experience level (5.6 years) than the average for all personnel in this type SPO (6.5 years). This result appears to be due to the manner in which data was collected. A number of the managers identified with non PAR/CAR programs appeared to be operating on their own, without any or a very small supporting staff. The data collected on SPO personnel for this level of program was obviously on programs for which a SPO existed and, therefore, at the higher end of the importance scale for this level of program. Managers of the non PAR/CAR SPOs selected for this study averaged 10.7 years of experience. For this reason, the data collected on managers below the PAR/CAR level is not conclusive. However, at least 40 percent of these managers had no previous acquisition management experience prior to being given responsibility for programs ranging in size from several hundred thousand to several million dollars. This may be a very expensive on-the-job training program.

The Air Force appears to be infusing a high degree of operational experience into its acquisition management programs. This practice should help keep these programs oriented towards the needs of the user and his environment.

Hq AFSC and Hq USAF experience level was high only for the major program managers. Results relating to this experience level for managers of the lesser programs may have again been distorted by the way in which the data was collected. Four of the 7 managers of those non CAR/PAR SPOs reviewed had had tours at one of these headquarters.

The educational background of all categories of officers examined was closely aligned to that identified as preferable. Predominantly these officers have undergraduate degrees in engineering, physical science, or mathematics. Compared with the rest of the officers in AFSC and the Air Force, considerably more program management personnel have graduate degrees, and these degrees are in the areas related to program management. Almost one-fourth of the officers included in this study had academic backgrounds in both technical and management areas.

Program management personnel also have a higher completion rate than the rest of AFSC or Air Force officers for all three levels of PME. Although not directly related to the program management job (except in the case of the Industrial College of the Armed Forces), completion of PME is generally considered to be career enhancing. Therefore, this factor could contribute to a higher success rate for these officers in competing for promotions. A very high completion rate for these schools was observed for the PAR and CAR program managers who for the most

part had already advanced to Colonel or General.

Completion of specialized training did not appear to be a significant factor. The numbers who had completed any of the three courses recorded were fairly low. Attendance at DSMS or participation in the EWJ program is somewhat restricted due to the long lengths of time and cost involved. However, it would appear that more advantage could be taken of the relatively short AFIT System Program Officer Course.

Bibliography

1. Memorandum for Secretaries of the Military Departments from Deputy Secretary of Defense, David Packard, dated 25 November 1969, "Career Specialty in Development Project Management."
2. Opening Address to the First Program Management Course, Defense Systems Management School, by Secretary of Defense David Packard, 3 May 1971.
3. Memorandum for Mr. Mendolia from Hugh E. Witt, Office of the Secretary of Defense, 21 November 1973, "Meeting With Secretary Clements Regarding Project Managers."
4. Air Force Manual 36-23, 30 June 1972, Officer Career Management.
Provides career guidelines for Air Force officers in all career areas.
5. A Systems Analysis by the Deputy Assistant for Senior Officer Management, DCS/Personnel, Hq AFSC, November 1970, "The System Program Director of the Seventies".
6. Blue Ribbon Defense Panel, Staff Report on Major Weapon Systems Acquisition Process, Report to the President and the Secretary of Defense of the Department of Defense, Washington, D.C., July 1970.
7. Remarks delivered by William P. Clements, Jr., Assistant Secretary of Defense, to students of the Program Management Course and the participants of the first General/Flag Orientation Seminar on Systems Acquisition Management, Defense Systems Management School, Fort Belvoir, Virginia, 16 October 1973.
8. Hearings before a Subcommittee of the Committee on Appropriations for 1973--House of Representatives--Department of Defense Appropriations for 1973, Part 4, 10 May 1972.

APPENDIX A

Data Tables

Explanation of Data Tables

1. Results are generally presented as a percentage of the total, except:
 - a. Acquisition management experience is presented as the average number of years for the number of officers assigned.
 - b. PME data is presented as a percentage of the total number of eligible officers, i.e.:
 - (1) SOS based upon number in grades 02 and above.
 - (2) Intermediate based upon number in grades 04 and above.
 - (3) Senior based upon number in grades 05 and above.
2. AFIT refers to the System Program Officer (Course 570) conducted by the Air Force Institute of Technology (AFIT) School of Systems and Logistics.
3. DSMS refers to the Program Management Course conducted by the Defense Systems Management School.
4. EWI refers to the Education-With-Industry programs in Cost Analysis, Financial Management, Production and Procurement

Management, Research Management, and Production and Quality Assurance which are administered by AFIT.

TABLE 1

PAR PROGRAM MANAGERS*

(10 Officers)

Demographic Data

Grade		Aero Rating		
06	07	Pilot	Nav	N/R
10	60	70	10	20

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
100	0	80	30	10	30

PME

SOS	Int	Sen
70	60	90

Experience

Acquisition Mgt			Op'l	Hq	Hq
R&D	SPO	Total	Exp	AFSC	USAF
6.8	4.2	11.0	80	20	50

Three of these officers had attended the Harvard Advanced Management Course; however, none had attended any of the specialized systems management training courses.

* All data in percentage except acquisition management experience which is the average in years.

TABLE 2

CAR PROGRAM MANAGERS*

(30 Officers)

Demographic Data

Grade				Aero Rating		
04	05	06	07	Pilot	Nav	N/R
3	17	77	3	57	17	27

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
100	3	63	33	13	30

PME

SOS	Int	Sen
70	57	60

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
6.0	5.0	11.0	100	33	40

Training

AFIT	DSMS	EWI
3	10	10

* All data in percentage except acquisition management experience which is the average in years.

TABLE 3

MANAGER OF NON PAR/CAR PROGRAMS*

(55 Officers)

Demographic Data

Grade				Aero Rating		
03	04	05	06	Pilot	Nav	N/R
29	35	33	4	38	17	45

Education

ES/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
84	5	42	29	0	29

PME

SOS	Int	Sen
71	31	15

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.3	3.3	5.6	93	9	9

Training

AFIT	DSMS	EWI
13	2	9

* All data in percentage except acquisition management experience which is the average in years.

TABLE 4

PAR PROGRAM OFFICE PERSONNEL*

(233 Officers)

Demographic Data

Grade						Aero Rating		
01/02	03	04	05	06	07	Pilot	Nav	N/R
7	42	30	12	7	1	25	9	65

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
72	20	30	33	2	26

PME

SOS	Int	Sen
65	37	44

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.0	3.2	5.2	68	4	8

Training

AFIT	DSMS	EWI
10	3	9

* All data in percentage except acquisition management experience which is the average in years.

TABLE 5

CAR PROGRAM OFFICE PERSONNEL*

(392 Officers)

Demographic Data

Grade						Aero Rating		
01/02	03	04	05	06	07	Pilot	Nav	N/R
9	47	19	16	7	.3	21	6	73

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
83	12	37	24	3	23

PME

SOS	Int	Sen
34	34	42

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.5	3.2	5.7	62	8	5

Training

AFIT	DSMS	EWI
9	1	7

* All data in percentage except acquisition management experience which is the average in years.

TABLE 6

NON PAR/CAR PROGRAM OFFICE PERSONNEL*

(79 Officers)

Demographic Data

Grade					Aero Rating		
01/02	03	04	05	06	Pilot	Nav	N/R
11	42	20	20	6	23	13	65

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
76	14	35	24	0	16

PME

SOS	Int	Sen
59	30	47

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.3	4.2	6.5	68	7	6

Training

AFIT	DSMS	EWI
14	6	10

* All data in percentage except acquisition management experience which is the average in years.

TABLE 7

ADTC SPO'S*

(32 Officers)

Demographic Data

Grade					Aero Rating		
01/02	03	04	05	06	Pilot	Nav	N/R
12	45	19	17	7	33	7	60

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
74	19	24	19	0	19

PME

SOS	Int	Sen
60	22	50

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.5	3.8	6.3	64	10	7

Training

AFIT	DSMS	EWI
7	7	10

* All data in percentage except acquisition management experience which is the average in years.

TABLE 8

ASD SPO'S*

(200 Officers)

Demographic Data

Grade						Aero Rating		
01/02	03	04	05	06	07	Pilot	Nav	N/R
7	37	31	17.5	7	.5	31	15	54

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
60	30	27	41	1	22

PME

SOS	Int	Sen
64	23	14

Experience

Acquisition Mgt			Op'l Exp	Hq	Hq
R&D	SPO	Total		AFSC	USAF
1.8	2.6	4.4	82	7	8

Training

AFIT	DSMS	EWI
8	2.5	12

* All data in percentage except acquisition management experience which is the average in years.

TABLE 9

ESD SPO'S*

(104 Officers)

Demographic Data

Grade						Aero Rating		
01/02	03	04	05	06	07	Pilot	Nav	N/R
4	46	32	11	7	1	19	6	75

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
83	13	37	28	4	32

PME

SOS	Int	Sen
63	31	32

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.4	3.5	5.9	77	8	9

Training

AFIT	DSMS	EWI
9	1	9

* All data in percentage except acquisition management experience which is the average in years.

TABLE 10

SAMSO SPO'S*
(358 Officers)

Demographic Data

Grade						Aero Rating		
01/02	03	04	05	06	07	Pilot	Nav	N/R
10	49	18	16	6	.2	17	5	78

Education

BS/BA		MS/MA		PhD	Comb
Tech	Mgt	Tech	Mgt		
89	9	39	26	1	22

PME

SOS	Int	Sen
54	33	38

Experience

Acquisition Mgt			Op'l Exp	Hq AFSC	Hq USAF
R&D	SPO	Total			
2.5	3.4	5.9	49	1	1

Training

AFIT	DSMS	EWI
11	1	2

* All data in percentage except acquisition management experience which is the average in years.

TABLE 11

SUMMARY--ALL OFFICERS INCLUDED IN STUDY*

(783 Officers)

Demographic Data

Grade						Aero Rating		
01/02	03	04	05	06	07/08	Pilot	Nav	N/R
8	42	24	17	8	1	25	9	66

Education

BS/BA		MS/MA		PhD	Tot	Comb
Tech	Mgt	Tech	Mgt		Grad	
80	14	36	27	2	65	24

PME

SOS	Int	Sen
47	36	43

Experience

Acquisition Mgt			Op'l Exp	Hq	Hq
R&D	SPO	Total		AFSC	USAF
2.5	3.6	6.1	68	7	4

Training

AFIT	DSMS	EWI
10	3	9

* All data in percentage except acquisition management experience which is the average in years.