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MBA PROFESSIONAL REPORT

Analyzing the Structure of Air Force Space Acquisition

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December 2006**

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**ANALYZING THE STRUCTURE
OF AIR FORCE SPACE ACQUISITION**

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ANALYZING THE STRUCTURE OF AIR FORCE SPACE ACQUISITION

ABSTRACT

The purpose of this research is to analyze the current structure of the acquisition arm of Air Force Space Command using the Policies and Process cornerstone of the GAO Framework for Assessing the Acquisition Function at Federal Agencies. The acquisition arm belonged to Air Force Materiel Command until 1 October 2001, when the reigns were transferred to Air Force Space Command to provide “cradle-to-grave” management from concept through development, acquisition, sustainment, and final disposal of space systems. The objective of this research is to determine if the current Air Force Space Acquisition policies and processes are efficient and effective according to the GAO-05-218G “Framework for Assessing the Acquisition Function at Federal Agencies”. This research provides results of a survey conducted by SMC personnel and recommendations for improvements.

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I. BACKGROUND

A. INTRODUCTION

Questions arose during the Clinton administration as to whether the Department of Defense (DoD) was effectively managing space activities. These questions prompted Congress to create a commission in the FY 2000 authorization bill to make recommendations on the overall management of the national space programs. Recommendations from this commission were released on January 11, 2001, in a report titled, “Report of the Commission to Assess the United States National Security Space Management and Organization” (also referred to as the Space Commission Report). The commission examined a variety of organizational approaches. Two recommendations that came out of this examination were 1) merging a number of space activities and 2) adjusting some chains of command. More specific to the United States Air Force (AF), the commission recommended, “The AF should realign headquarters and field commands to more effectively organize, train, and equip for prompt and sustained space operations. Air Force Space Command (AFSPC) should be assigned responsibility for providing the resources to execute space research, development, acquisition and operations, under the command of a four-star general.”¹ The recommendation included moving the Air Force’s Space and Missile Systems Center (SMC) out from under Air Force Material Command (AFMC) and aligning it under AFSPC. The realignment, which took place October 1, 2001, gave AFSPC the “cradle-to-grave” responsibilities for space operations and acquisitions.

Figure 1 depicts the organization of Space within the AF prior to the realignment. At the time space related activities were centered in the following four elements.

¹ Report of the Commission to Assess United States National Security Space Management and Organization Washington D.C.: Space Commission, 89, <<http://www.defenselink.mil/pubs/space20010111.pdf>> (accessed 5 April 2006).

1. AFSPC controlled space system operations and requirements.
2. Where as SMC, under the command of AFMC was responsible for design, development, acquisition of space launch, command and control, and satellite systems.
3. The Program Executive Officer (PEO) and the SMC Commander served as the Designated Acquisition Commander (DAC). Each reported the cost, schedule and performance of programs they were responsible for to the Assistant Secretary of the Air Force for Acquisitions (ASAF (A)).
4. Advanced technology research was conducted by the Air Force Research Laboratory, which was also part of AFMC.

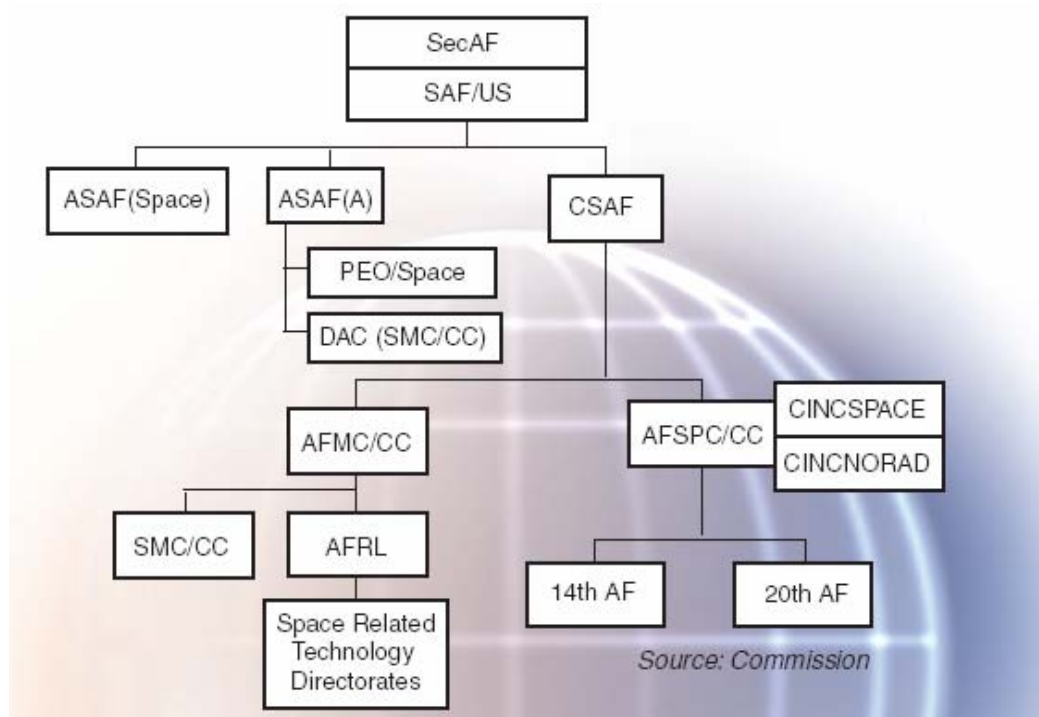


Figure 1. Organization of Space within the Air Force prior to Realignment
(From: Space Commission Report, 56)

When consolidating the space functions into a single organization, The Space Commission's goals were to achieve the following:

1. An environment with a strong center of support for space professionals.
2. Space professionals charged with developing doctrine, concepts of operations and new systems to achieve national space goals and objectives.
3. More uniformed Military in the Research and Development (R&D) and acquisition of space systems.
4. Developing a Space cadre and advocating education and training for Space professionals.²

Figure 2 shows the organization for Space after the recommendations from the Space Commission Report. As the organization chart shows, the PEO and DAC were re-assigned to report directly to the Under Secretary of the Air Force (SAF/US) to provide program oversight and staff support for AF space acquisition programs.

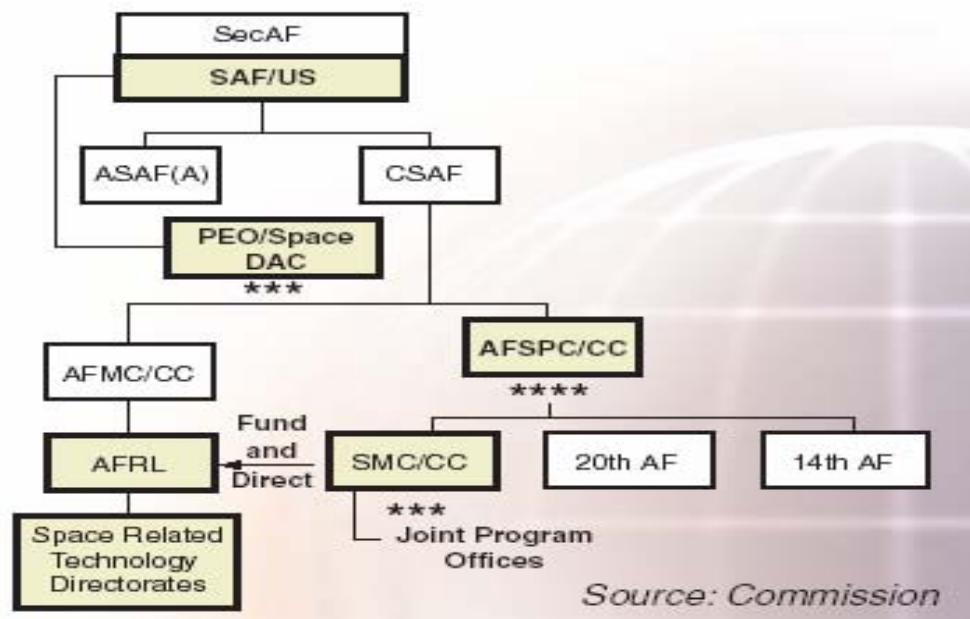


Figure 2. Recommended Organizational Approach for Space in the Air Force (From: Space Commission Report, 90)

² Space Commission Report, 136.

SMC was moved out of AFMC and placed under the command of AFSPC. This in turn gave the AFSPC Commander (AFSPC/CC) the authority to program funds and direct R&D programs within the AF laboratory system.

The purpose of this professional report is to analyze the current structure of space acquisitions in AFSPC. A focus will be made on how effective and efficient the policies and practices are with the “space acquisition arm” now under AFSPC. This research will analyze if there is a strong commitment in place by way of process, doctrine, and reorganization to achieve the goals and objectives outlined in the Space Commission Report. More specifically this research will look at AFSPC’s current policies and processes, based on the acquisition realignment, to determine if they are operating efficiently and effectively. In conclusion, this report will provide guidance on areas in need of improvement and areas of best practices.

B. TERMS AND DEFINITION

The following terms and definitions provide the basis for understanding of the concepts that are discussed throughout this research paper.

Acquisition Arm is defined as the entity in charge of the acquisition of space assets and systems.

Air Force Materiel Command (AFMC) conducts R&D, test and evaluation; and provides acquisition management services and logistics support necessary to keep AF weapon systems ready for war.³

Air Force Space Command (AFSPC) provides a full-spectrum space combat command preeminent in the application of space power for national security and joint warfare.⁴

Automated Business Services System (ABSS) The Air Force standard system for processing of financial documents. The system is designed to comply with DoD and

³ Air Force Link. “Air Force Materiel Command Fact Sheet.” May 2006.
<<http://www.af.mil/factsheets/factsheet.asp?fsID=143>> (accessed 16 May 2006).

⁴ Air Force Link. “Air Force Space Command Fact Sheet.” October 2006.
<<http://www.af.mil/factsheets/factsheet.asp?id=155>> (accessed 16 May 2006).

AF regulatory guidance. ABSS enables any government official with a requirement to procure an end item or service, to enter that requirement on-line into an electronic system. The requirement for the end item or service is then accessible electronically to the various acquisition business entities so that they may carry out their respective responsibilities.⁵

Contracting Officer (CO) A person with authority to enter into, administer, and/or terminate contracts and make related determinations and findings for the United States Government.⁶

Component Acquisition Executive (also called Service Acquisition Executives (SAEs) (CAE) Secretaries of the Military Departments or Heads of Agencies with the power of redelegation. The CAEs are responsible for all acquisition functions within their Components. This includes both the SAEs for the Military Departments and acquisition executives in other DoD Components, such as the U.S. Special Operations Command (USSOCOM) and Defense Logistics Agency (DLA), which have acquisition management responsibilities. In the Military Departments, the CAEs are respectively, the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(AL&T)), the Assistant Secretary of the Navy (Research, Development and Acquisition) (ASN(RD&A)), and the Assistant Secretary of the Air Force (Acquisition) (ASAF(A)).⁷

Defense Acquisition Executive (DAE) is the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)) who has responsibility for supervising the Defense Acquisition System. The DAE takes precedence on all acquisition matters after the Secretary and the Deputy Secretary.⁸

5 Financial Analysis STUDY GUIDE (SG), E3AZR6F071 009-II, p3-7, May 2000, 782D TRAINING GROUP, 364th Training Squadron, Sheppard Air Force Base, Texas

6 Defense Acquisition University. "Glossary of Defense Acquisition Acronyms and Terms." 2005. <http://www.dau.mil/pubs/glossary/12th_Glossary_2005.pdf> (accessed 20 July 2006).

7 Defense Acquisition University.

8 DoD 5000.1 "The Defense Acquisition System," May 12, 2003. <<http://www.dtic.mil/whs/directives/corres/html/50001.htm>> (accessed 2 June 2006).

Defense Acquisition System is the management process by which the Department of Defense provides effective, affordable, and timely systems to the users.

Designated Acquisition Commander (DAC) is the individual that supervises the execution of programs that are not assigned to a PEO.⁹

Development The process of working out and extending the theoretical, practical, and useful applications of a basic design, idea, or scientific discovery. Design, building, modification, or improvement of the prototype of a vehicle, engine, instrument, or the like as determined by the basic idea or concept. Includes all efforts directed toward programs being engineered for Service use but which have not yet been approved for procurement or operation, and all efforts directed toward development engineering and test of systems, support programs, vehicles, and weapons that have been approved for production and Service deployment.¹⁰

Federal Acquisition Regulation (FAR) The regulation for use by federal executive agencies for acquisition of supplies and services with appropriated funds. The FAR is supplemented by the Military Departments and by DoD. The DoD supplement is called the DFARS (Defense FAR Supplement).¹¹

FLY-OFF It is the competing of two different companies against each other, to determine which industry platforms are best suited to meet the service's need for a new model.

Full Rate Production (FRP) Contracting for economic production quantities following stabilization of the system design and validation of the production process.¹²

9 Air Force Federal Acquisition Regulation, "Subpart 5302.1 Definitions."
<<http://farsite.hill.af.mil/archive/AFFARS/2006-0515/5302.htm>> (accessed 30 May 2006).

10 Air Force Instruction 10-501. AT&L Knowledge Sharing System.
<<http://akss.dau.mil/askaprofakss/qdetail2.aspx?cgiSubjectAreaID=24&cgiQuestionID=14355>> (accessed 20 July 2006).

11 Defense Acquisition University

12 Ibid.

General Accounting and Finance System (GAFS/BQ) Installation level accounting in support of the United States Air Force.¹³

Government Accountability Office (Formerly the General Accounting Office) (GAO) An agency of the Legislative Branch, responsible solely to the Congress, which functions to audit all negotiated government office contracts and investigate all matters relating to the receipt, disbursement, and application of public funds. Determines whether public funds are expended in accordance with appropriations to audit all negotiated government office contracts and investigate all matters relating to the receipt, disbursement, and application of public funds. Determines whether public funds are expended in accordance with appropriations.

Life Cycle Cost (LCC) The total cost to the government of acquisition and ownership of a system over its useful life. It includes the cost of development, acquisition, operations, and support (to include manpower), and where applicable, disposal. For defense systems, LCC is also called Total Ownership Cost (TOC).¹⁴

National Security Strategy (NSS) This document is produced yearly by the National Security Council (NSC) and signed by the President. It provides grand strategy and overarching national security goals and objectives for the United States.¹⁵

Major Force Program (Also Major Program) (MFP) In the context of the Future Years Defense Program (FYDP), a Major Program is an aggregation of Program Elements (PEs) that reflects a force or support mission of DoD and contains the resources necessary to achieve an objective or plan. It reflects fiscal time phasing of mission objectives to be accomplished and the means proposed for their accomplishment¹⁶

Milestone Decision Authority (MDA) Designated individual with overall responsibility for a program. The MDA shall have the authority to approve entry of an

¹³ DTS Travel Center, "Systems connected to DTS."
<http://www.dtstravelcenter.dod.mil/secs/RI_Systems.cfm> (accessed 7 November 2006).

¹⁴ Defense Acquisition University.

¹⁵ Ibid.

¹⁶ Air Force Instruction 10-501. AT&L Knowledge Sharing System. <<http://akss.dau.mil/askaprof-akss/qdetail2.aspx?cgiSubjectAreaID=24&cgiQuestionID=14355>> (accessed 20 July 2006).

acquisition program into the next phase of the acquisition process and shall be accountable for cost, schedule, and performance reporting to higher authority, including congressional reporting.¹⁷

Program Action Directive (PAD) is defined as a formal planning document that helps accomplish a major action such as the reorganization or formation of a MAJCOM, organization, unit or function. The PAD is also used to direct programs on new acquisitions, and modifications. It states the objectives of the program, assigns specific tasks to Office of Primary Responsibility (OPR) and Office of Collateral Responsibility (OCR), and establishes milestones.¹⁸

Program Control This term is used for the budget/financial management offices in the Air Force acquisition community.

Program Executive Officer (PEO) is a military or civilian official who has responsibility for directing several Major Defense Acquisition Programs (MDAPs) and for assigned major system and non-major system acquisition programs. A PEO has no other command or staff responsibilities within the Component, and only reports to and receives guidance and direction from the DoD Component Acquisition Executive (CAE).¹⁹

Program Management Administration (PMA) Allowable Costs are those costs, other than payroll costs for government personnel that support the operation of a program office in its management and oversight role. These include costs such as travel, printing, supplies, equipment, program office unique computer and communication costs, and pre-litigation (before contractor files appeal with Armed Services Board of Contract Appeals or initiates action in court) costs such as evaluation of claims. Advisory and Assistance Services and Federally Funded Research and Development Center contractor support to a program office are also PMA

17 "The Defense Acquisition Management Framework, DoD Directive 5000.1." U.S. Department of Defense. May 2003. <<http://akss.dau.mil/dag/DoD5002/Figure1.asp>> (accessed 2 September 2006).

18 Air Force Instruction 10-501.

19 Defense Acquisition University.

Program Manager; Project Manager (PM) Designated individual with responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs. The PM shall be accountable for credible cost, schedule, and performance reporting to the Milestone Decision Authority (MDA).²⁰

Research and Development (R&D) Research Includes all scientific study and experimentation directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. Program Elements (PEs) in this category involve pre-Milestone A efforts.

System Program/Project Office (Air Force) (SPO) The office of the Program Manager (PM) and the single Point of Contact (POC) with industry, government agencies, and other activities participating in the system acquisition process.²¹

Space and Missile Systems Center (SMC) manages the R&D, design, acquisition and sustainment of space launch, command and control, missile systems and satellite systems.²²

Space System is defined as all of the devices and organizations forming the space network. These consist of: Spacecraft; mission package(s); ground stations; data links among spacecraft, ground stations, mission or user terminals, which may include initial reception, processing, and exploitation; launch systems; and directly related supporting infrastructure, including space surveillance and battle management/command, control, communications, and computers.²³

Transformation is defined by the AF as a process by which the military achieves and maintains advantage through changes in operational concepts, organization, and/or

²⁰ Defense Acquisition University.

²¹ Ibid.

²² Air Force Space Command Fact Sheet, 2006

²³ B. S. Lambeth. "Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space." A Guide to RAND Publications. 2003. <http://www.rand.org/natsec_area/force.html. 135g> (accessed 18 September 2006).

technologies that significantly improve its war fighting capabilities or ability to meet the demands of a changing security environment.²⁴

C. RESEARCH OBJECTIVE

The objective of this report is to analyze the AF's space acquisitions current structure under AFSPC and determine if the "Policies and Processes" are efficient and effective, as determined by the GAO's "Framework for Assessing the Acquisition Function at Federal Agencies". This analysis will provide feedback to AFSPC on strengths and weaknesses found, in addition to recommendations for future research.

D. BENEFITS OF RESEARCH

By focusing on these objectives, the research will provide lessons learned to the AF space acquisition community on the efficiency and effectiveness of their current processes. Based on a survey this research will provide areas for improvement and a roadmap for improving the processes to reflect what is considered best practices by the GAO assessment framework.

E. LIMITATIONS AND ASSUMPTIONS

The limitations on this research are based on the use of only one model; GAO's assessment framework model. The survey developed was based only on the GAO's assessment framework to determine if policies and processes are effective and efficient in AF Space acquisitions. This is not a quantitative research focusing on statistical significance, but a qualitative exploratory study. Another limitation is that the data gathered is based on only those personnel who answered the questionnaire. Furthermore, it is the first time the GAO assessment framework has been utilized at SMC for this type of analysis. Since there are no historical surveys to compare our research to it is limited to only recent information based off current members stationed at SMC. Without prior year surveys a statistical study could not be accomplished.

²⁴ A. J. Fernandez. "Military Role in Space Control: A Primer." CRS Report for Congress. 2004. <<http://www.fas.org/man/crs/RL32602.pdf>> (accessed 15 August 2006).

The major assumption of this research is that the Space Commissions recommendations have been put into practice. Other assumptions are that the official documents are accurate and derived from DoD directives and AF regulations.

F. METHODOLOGY

The methodology of this research was designed to provide a broad understanding of the strengths, weakness, issues, policies and processes of the space acquisition arm. Material used in the literary review chapter of this research consisted of studies and reports from organizations such as RAND Corporation, audit reports from the Government Accountability Office (GAO), documentation provided by the AF community, and the Space Commission Report. This report provides additional insight relating to the management and leadership of space acquisitions from personnel in the AFSPC community through surveys. An on-line survey was created based off guidelines in the GAO assessment framework. The survey was distributed to personnel working at SMC. The data from the surveys was analyzed in Chapter IV. The report verifies the existence of critical success factors as determined by the GAO assessment framework.

G. ORGANIZATION OF RESEARCH

This report is organized into five chapters to ensure a concise review of areas analyzed. This chapter has provided the introduction and background to the study, to include an overview of the research project, objectives and limitations. Chapter II will include a literature review comprised of documents such as the Space Commission report, PAD and Draft Transition Strategy AFSPC-SMC Realignment. Along with these topics, Chapter II will develop a framework for analysis using the GAO report on “Framework for Assessing the Acquisition Function at Federal Agencies.” This assessment framework will provide a qualitative assessment of the strength and weaknesses of space acquisition functions in AFSPC using one of the four cornerstones. These cornerstones use an interrelated approach; however each can stand alone or can be integrated in order to tailor evaluations. The literature review will be conducted using Government Legislation, AF regulations, and DoD guidance. Chapter III will provide a real-world analysis based on current practices and questionnaires conducted during this research project. Additionally, Chapter III will include a summary and analysis of the

answers to the questions used in the questionnaires. Chapter IV will compare and contrast results of the literature review with the results of the current practices and surveyors; this chapter will also summarize the results of the analysis obtained in previous chapter. Chapter V will provide overall conclusions, recommendations and areas for further research.

H. SUMMARY

In conclusion, Chapter I outlines the goals and objectives of this research, which are to determine if the AF Space acquisition community's current policies and processes are performing effectively and efficiently as determined by the GAO Assessment Framework. Included in this chapter is background information on recommended actions by the Space Commission and the changes made in organizational alignment.

II. LITERATURE REVIEW

A. CHAPTER OVERVIEW

This chapter discusses some of the findings and recommendations of the 11 January 2001 Commission to Assess United States National Security Space Management and Organization Report (referred to as the Space Commission Report). Furthermore, it provides a brief background description of AFSPC and SMC and the SMC transfer from AFMC to AFSPC that took place 1 October 2001. It covers the acquisition, contracting and program control regulations that govern space acquisitions. For example, it provides an overview of the non-space acquisition process and the space acquisition process. It thoroughly discusses the acquisition process guidance in accordance DoD Directive 5000.2, and then moves into an assessment of space acquisitions in accordance to the National Security Space Policy (NSSP 03-01). It covers the contracting FAR and the AF Budget regulations related to space acquisitions. It highlights emerging technologies in acquisitions, contracting and program controls that are currently being used to acquire AF space systems. Additionally, space acquisition programs have been reported by the GAO as consistently being behind schedule and over cost and not meeting performance requirements. This chapter looks into cost overruns and delays in the Space Based Infrared System (SBIRS) and Evolved Expendable Launch Vehicle (EELV). The chapter concludes by identifying the GAO Assessment Framework Model as the assessment tool utilized to analyze space acquisition functions at AFSPC.

B. COMMISSION TO ASSESS UNITED STATES NATIONAL SECURITY SPACE MANAGEMENT AND ORGANIZATION

1. Introduction

The U.S is aware that to become masters of space they would need to find ways that would move them toward reducing the cost of building and launching space systems. Annually, billions of dollars are spent on space systems in which many will not near completion until 10 to 15 years from now. This means today's requirements at tomorrow's prices may not allow the U.S. to remain the leader in space. The sustainment

of space assets makes up approximately 30 percent of the life cycle cost.²⁵ Given that 70 percent of the costs are upfront, it is essential that DoD, the intelligence community, and the nation as a whole find ways to increase their investments in career development, education and training, and innovative requirements generation when dealing with space acquisition.²⁶ In late 2000, the House and Senate Armed Services Committees and the Secretary of Defense (SECDEF), appointed a Commission to assess the organization and management of space activities in support of United States (U.S.) national security. This commission was to provide specific recommendations to improve oversight, management, acquisition and operation of U.S. military space systems and capabilities.

In order to achieve national security objectives, the U.S. must compete successfully internationally and maintain technological leadership in space. To do this, they must have a healthy industrial base and improved science and technology resources. Moreover, the U.S. must position themselves as risk takers and innovators, not to mention establish government policies that support international competitiveness.

The Commission was established pursuant to Public Law 106-65, the National Defense Authorization Act for Fiscal Year 2000, Section 1622 and mandated the following in its charter:

The Commission shall, concerning changes to be implemented over the near-term, medium-term and long-term that would strengthen United States national security, assess the following:

- (1) The manner in which military space assets may be exploited to provide support for United States military operations.
- (2) The current interagency coordination process regarding the operation of national security space assets, including identification of interoperability and communications issues.
- (3) The relationship between the intelligence and non-intelligence aspects of national security space ... and the

25 R.W. McKinney. "Space Acquisitions Today." Air Force Space Command High Frontier. December, 2005. <<http://www.afspc.af.mil/library/highfrontierjournal.asp>> (accessed 18 July 2006).

26 R. Catlin. "SMC Mission Brief." Naval Postgraduate School, Monterey, California. June, 2006

potential costs and benefits of a partial or complete merger of the programs, projects, or activities that are differentiated by those two aspects.

(4) The manner in which military space issues are addressed by professional military education institutions.

(5) The potential costs and benefits of establishing:

(A) An independent military department and service dedicated to the national security space mission.

(B) A corps within the AF dedicated to the national security space mission.

(C) A position of Assistant SECDEF for Space within OSD

(D) A new major force program, or other budget mechanism, for managing national security space funding within DoD.

(E) Any other change in the existing organizational structure of DoD for national security space management and organization.²⁷

The National Defense Authorization Act for Fiscal Year 2001 amended the Commission mandate, adding the following task:

(6) “The advisability of:

(A) Various actions to eliminate the requirement for specified officers in the United States Space Command to be flight rated that results from the dual assignment of such officers to that command and to one or more other commands for which the officers are expressly required to be flight rated;

(B) The establishment of a requirement that all new general or flag officers of the United States Space Command have experience in space, missile, or information operations that is either acquisition experience or operational experience; and

(C) Rotating the command of the United States Space Command among the Armed Forces.”²⁸

²⁷ Space Commission Report, 1

²⁸ Space Commission Report, 2

2. Space Commission Recommendations

The Space Commission recommendations were formally released on 11 January 2001. The recommendations were based on the following five areas:

1) The role for space in future national security affairs and the challenges the U.S. is likely to confront to its commercial, civil, defense and intelligence interests in space.

2) Objectives for advancing U.S. interests in space by enabling and encouraging development of policies, personnel, technologies and operations essential to maintaining U.S. leadership.

3) U.S. agencies involved in national security space as a basis for understanding current practices and identifying alternative approaches to organization and management.

4) Current management of space activity at the national level, within DoD and within the Intelligence Community.

5) Recommendations for organization and management, including specific proposals to address discrete issues and problems identified in the course of the Commission's deliberations.²⁹

The commissions recommendations discussed in this report will focus on AF acquisition related items.

There are many organizations involved with National Security Space (NSS). Figure 3, displays an example of the organizations from the President all the way down to an organization in the AF involved with NSS (prior to the commissions' recommendations).

²⁹ Space Commission Report, 1-7.

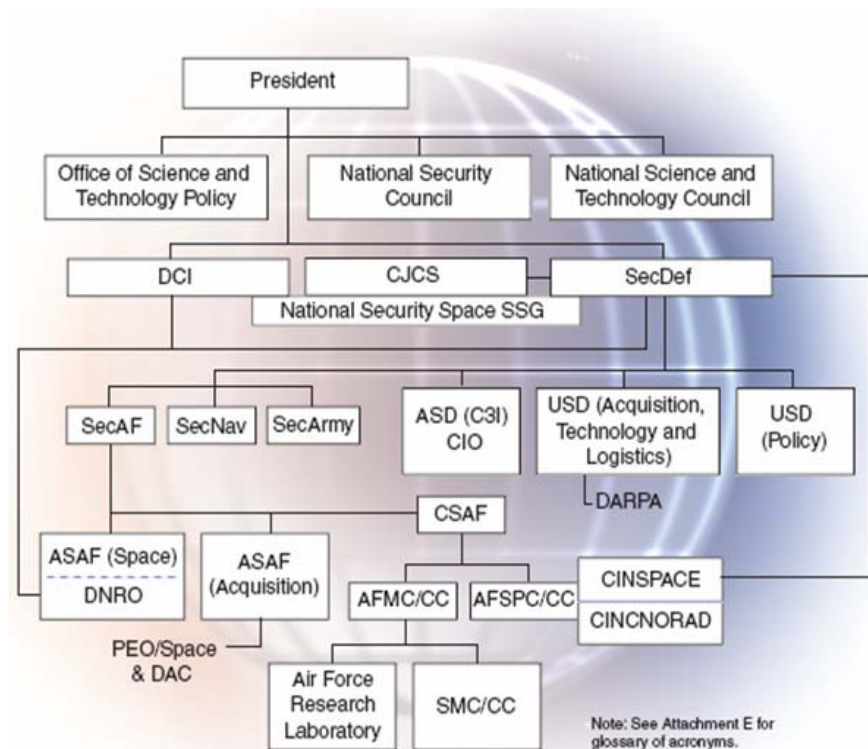


Figure 3. National Organizational Chart (From: Space Commission Report, 32)

The SECDEF directs each of the military services and guides them on how to execute specific space programs, comply with DoD space policy and integrate space capabilities into its strategy, doctrine, education, training, exercises and operations.³⁰

Although the SECDEF directs the services, each has the responsibility to their own space capabilities to perform their mission. However, the Space Commission recommended the SECDEF designate the AF as Executive Agent for Space within DoD and recommended amending Title X of the U.S. Code to assign the AF formal statutory authority to organize, train, and equip for offensive and defensive space operations. This would also give the AF the responsibility of developing, defending, and submitting a joint “Space Program Plan” for all DoD space requirements. Figure 4 shows the new structure recommended by the space commission.

³⁰ Space Commission Report, 32.

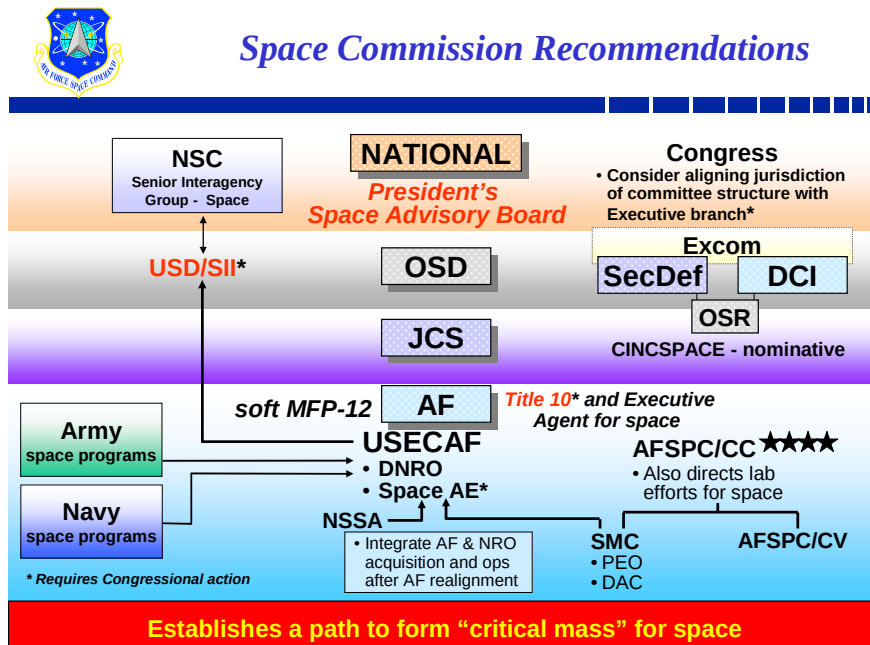


Figure 4. Implemented Realignment (From: “Space Commission and the Future of Ground Systems Briefing.” Space and Missile Slideshow: March 2002.)

The AF already controls more than half of space-related budget activity within DoD (85 percent) and AFSPC is directly responsible for these systems. Each year they are responsible for spending billions of dollars to meet mission area requirements through the procurement and deployment of launch vehicles and space systems. Not only are these systems costly, but they have high 'up-front' expenses compared with those of operation and/or disposal, and they usually require many years of research and development before the systems become operationally capable.³¹ For example, a launch vehicle, Atlas V Rocket, and its corresponding satellite system (command and control) require a launch entailing extensive preparation for deployment before launch, e.g., ground support assistance and personnel training. Once a space system has been launched, the cost of maintaining the satellite system is a fraction of the total life-cycle cost, consisting primarily of operating and maintaining ground stations and related personnel.

31 G.G. Brown, R.F. Dell, H. Holtz, and A.M. Newman. “How US Air Force Space Command Optimizes Long-Term Investment in Space Systems. Interfaces. 2003. <<http://dx.doi.org/10.1287/inte.33.4.1.16369>> (assessed on 18 November 2006)<

Another recommendation from the Space Commission Report involving the AF was related to the Commander in Chief of U.S. Space Command (CINCSpace) NORAD and AFSPC Commander. The commission recommended that the CINCSpace/CINCNOAD continue to concentrate on space as it relates to warfare in the mediums of air, land, sea and space. The primary role of the CINCSpace is to conduct space operations and provide space-related services, to include computer network defense/attack missions in support of the operations of the other CINCs, and the national missile defense. With these broad and varied set of responsibilities the commission believed he/she would have little time for other assigned duties and recommended that the Secretary of the Air Force (SECAF) create a new, separate position for the AFSPC Commander, separate from the CINCNOAD/CINCSpace.

Furthermore, the Space Commission Report recommended that the SECDEF end the practice of assigning only AF flight-rated officers to the position of CINCSpace/CINCNOAD. Under this practice, only flight-rated AF officers could serve as CINCSpace/CINCNOAD. The commission believes it is in the nation's best interest to let the best-qualified officer from any Service fill the position of CINCSpace. This would help ensure that an officer from any Service with an understanding of combat and space could be assigned as CINCSpace. Also, the CINCSpace position should remain nominative and needs to be rotated among the military Services, especially since this position plays a significant role in developing long-term requirements for space systems for DoD as a whole, which are increasingly "joint." Moreover, by separating these positions, it would allow the individual with the required in-depth knowledge of space acquisition and operations be selected for the position of AFSPC Commander.

Along with assigning the AF as the Executive Agent for Space within DoD, the commission made recommendations that AFSPC be assigned responsibility for providing the resources to execute space research, development, acquisition and operations, under the command of a four-star general. This recommendation entailed moving SMC out from under AFMC and realigning it under AFSPC. This move would allow the AFSPC Commander the authority to program funds, direct research, and development programs within the AF laboratory system. In essence, AFSPC would have "cradle-to-grave"

responsibility on AF space acquisitions, which would create a strong center of advocacy for space and an environment in which to develop a cadre of space professionals. Furthermore, the commission believes this realignment would better meet operational needs due to the increased role of the uniformed military in research, development and acquisition of space systems.

Another recommendation the commission made dealt with aligning AF and National Reconnaissance Office (NRO) Space Programs based on “best practices” of each organization. By appointing a single official within the AF the authority for the acquisition of space systems for both the AF and NRO, the commission felt that both the DoD and Intelligence Community would benefit. This entailed assigning the SAF/US to the positions of Air Force Acquisition Executive for Space and the Director of NRO (this recommendation would require a change in DoD directives, and possibly Congressional action to amend Title 10 U.S.C....both the directives and the law implies that a Service may have only a single acquisition executive).³² This position would create a senior-level advocate for space within the AF and it would offer a single person the authority to acquire space systems for the AF and NRO. In addition, this individual would oversee space matters related to acquisition, financial management, manpower and infrastructure.

The commission had concerns relating to how space budgeting activities seem to be untraceable at top level. Currently, Space funding uses many appropriations across DoD and the Intelligence Community. This causes the problem of not being able to identify and aggregate funding information for DoD space programs. For instance, when satellite programs are funded in one appropriation and terminals in another program, disconnects and duplications can occur.

The space commission recommended alternative budget mechanisms, such as setting up a Space appropriation or create a Space Major Force Program (MFP). The report suggested that the SECDEF establish a MFP for Space. The Space MFP would provide insight into the management of space programs without restricting the flexibility of the SECDEF, Central Intelligence Agency or the military departments. As a

³² Space Commission Report, 91.

management tool, this could be useful in helping make the various elements of DoD's space program more visible and provide accountability for space funding decisions.

The space commission believes the MFP should be managed in the same fashion as MFP 1 through 10 that DoD already has in place. It would contain the same program elements as the previously recommended Space Program Plan, which would be managed under the direction of the AF as Executive Agent for Space (previous recommendation). Furthermore, by establishing a MFP for Space, DoD would be able to aggregate related budget items into a single program independent of the appropriation process.

C. DOD DIRECTIVE 5000 SERIES GUIDANCE AND DIRECTIVES

The DAE issued the DoD Directive 5000 series to provide governing policy and guidance for the acquisition of defense systems.

1. DoD Directive 5000.1

The acquisition process is directed by DoD 5000.1; it is the governing DoD policy document on "Defense Acquisition." The primary objective of DoD 5000.1 is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price.³³ This directive [DoD 5000.1] applies to all elements of the DoD and describes policies and broad management principles that are applicable to all DoD acquisition programs.

This directive does not provide specific guidance to specific defense systems, but merely provides direction to Program Managers (PM) and Milestone Decision Authorities (MDA) on how to tailor program strategies and oversight by using innovation to reduce cycle time to meet operational needs. Additionally, this directive states the following principals will be followed: collaboration, financial management, professional workforce, and a streamlined organization just to highlight a few.

To govern the implementation of these acquisition policies and principles, DoD 5000.2 was established.

³³ The Defense Acquisition Management Framework.

2. DoD Directive 5000.2

This directive specifies “Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS).” Its stated purpose is “to establish a simplified and flexible management framework for translating mission needs into stable, affordable, and well-managed programs”.³⁴ The regulation is organized into five parts as shown in Figure 5 with six appendices and it contains a myriad of specific requirements pertaining to acquisition programs.

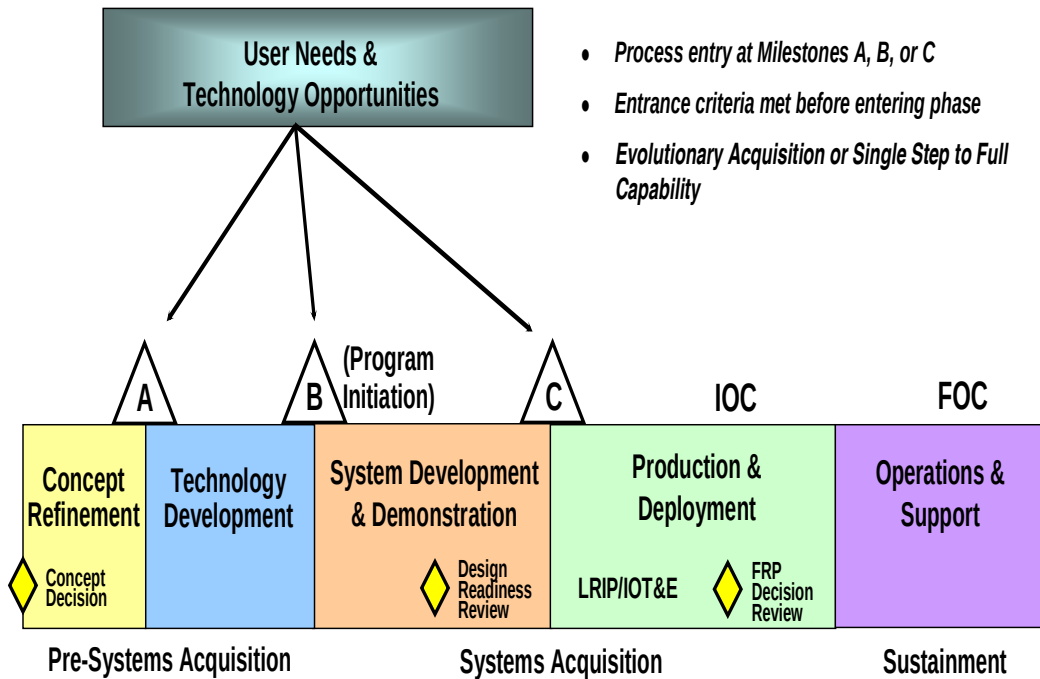


Figure 5. The Defense Acquisition Management Framework (After: The Defense Acquisition Management Framework)

The PM and MDA are to use the Defense Acquisition Management Framework when procuring defense systems. The MDA may authorize entrance into the acquisition system at any point, so long as it is consistent with phase-specific entrance criteria and statutory requirements. The progression through this acquisition life cycle is dependent upon sufficient knowledge acquired and efforts made on behalf of the PM.

³⁴ “Operation of the Defense Acquisition System, DoD Directive 5000.2.” U.S. Department of Defense. May 2003. <<http://akss.dau.mil/dag/DoD5002/Subject.asp>> (accessed 2 September 2006).

D. DOD LIFE CYCLE COSTS

Life cycle costs are the total cost to the government for a program (e.g., weapon system) over its full life, including research and development, support equipment, initial inventories, training, data, facilities, and other investments. Life Cycle Costs may also include the costs associated with the operation and support of systems. Regardless of the system, there is an involved cost. The typical DoD system (i.e., aircraft weapon program) incurs increased life cycle cost during production and operational support. The primary difference in space programs is they incur a larger percentage of their life cycle costs before deployment compared to aircraft weapons programs. Figure 6 shows a theoretical life cycle comparison of DoD systems and space systems. Although space systems are composed of ground based control systems and terminals, the space-based portion of the system drives key decisions as the impact of failure is greatly magnified. Systems must work when placed on-orbit for long periods of time, without maintenance, in some cases 10 years or longer.³⁵

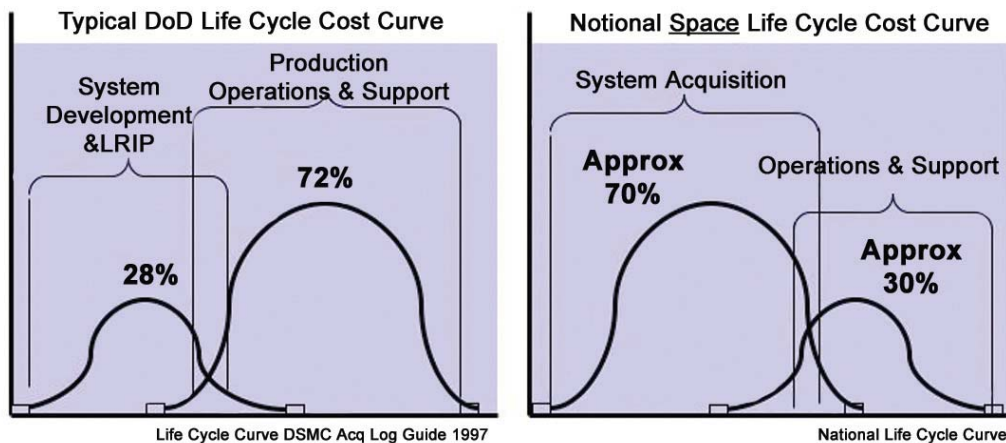


Figure 6. Typical and Space Life Cycle Cost Curves (From: McKinney, R.W. "Space Acquisitions Today." Air Force Space Command High Frontier. December, 2005. <<http://www.afspc.af.mil/library/highfrontierjournal.asp>> (accessed 18 July 2006).

35 R.W. McKinney

Therefore, it is essential that systems engineering is accomplished correctly before launch to ensure program success. Furthermore, seldom are there “test” satellites made before a production run, which means it must be done right the first time around.

Thus the need for an acquisition process and policy with these factors in mind would be needed for future space acquisitions. In additions the MDA needed to create a new streamlined acquisition policy for space systems separate from the defense systems.

E. FEDERAL ACQUISITION REGULATION (FAR)

In contrast to DoD 5000.2, which defines an overarching DoD acquisition management process and mandatory procedures, the Federal Acquisition Regulation (FAR) regulates acquisition planning and contracting. The FAR governs all acquisition practices and codifies uniform policies and procedures to regulate the acquisition of supplies and services by all executive agencies.³⁶ The importance of the FAR is that it is the highest ranking document with statutory regulations within it, and is the common denominator in every contracting acquisition initiated by DoD (or any other executive agency of the federal government, except where expressly excluded).

F. NATIONAL SECURITY SPACE ACQUISITION POLICY 03-01

Differences between acquisition of defense systems and acquisition of space systems in DoD drove the creation of NSS Acquisition Policy 03-01. This policy complements, not replaces, the existing DoD acquisition guidance found in DoDD 5000.1 and DoDI 5000.2. As with any policy, the intent of NSS 03-01 was not to constrain the acquisition community to a strict set of rules that must be followed at all costs. Rather, it is a guide that outlines the major documents, decisions, and products expected from an acquisition program. The DoD not only wanted to follow a more logical acquisition model for space, but it also wanted to improve its ability to acquire space systems that met the user’s needs.

Figure 7 highlights three of the differences between defense systems acquisition and space systems acquisition.

³⁶ Air Force Federal Acquisition Regulation, “Subpart 5302.1 Definitions.” <<http://farsite.hill.af.mil/vffara.htm>> (accessed 30 May 2006).

Tailor Acquisition for Space



Figure 7. Differences between Defense and Space Systems Acquisition (From: Capt Jennifer Martin, October 2006).

- 1) Fly Offs are non-existent for a satellite system like the Defense Satellite Communication System (DSCS) in contrast to the F-22.
- 2) According to the Defense Acquisition University, Low-rate Initial Production (LRIP) is described as:

The first effort of the Production and Deployment (P&D) phase. The purpose of this effort is to establish an initial production base for the system, permit an orderly ramp-up sufficient to lead to a smooth transition to Full Rate Production (FRP), and to provide production representative articles for Initial Operational Test and Evaluation (IOT&E) and full-up live fire testing. . The minimum number of systems (other than ships and satellites) to provide production representative articles for Operational Test and Evaluation (OT&E), to establish an initial production base, and to permit an orderly increase in the production rate sufficient to lead to Full Rate Production (FRP) upon successful completion of Operational Testing (OT). For ships and satellites, the LRIP quantity is the minimum quantity and rate that preserves mobilization.³⁷

- 3) Hardware modifications after launch do not exist in missile launches where as aircraft tend to have numerous modifications throughout their flying years.

Figure 8 shows a historical example of a large quantity DoD program.

³⁷ Defense Acquisition University, 139

Aircraft Acquisition/ Production Profile: (Advanced Tactical Fighter- F-22)

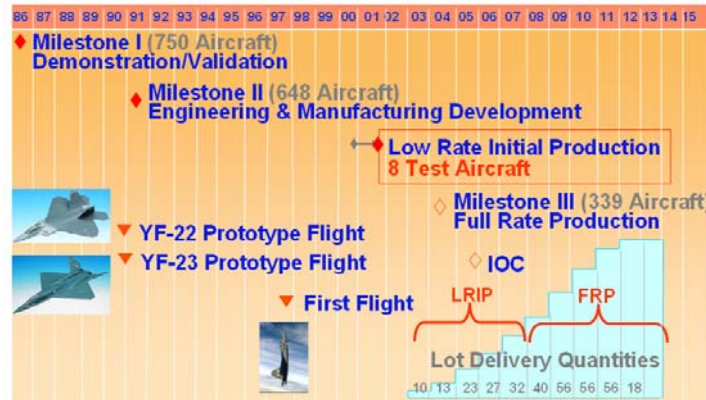


Figure 8. F-22 Production Profile (From: National Security Space Institute. "The National Security Space Acquisition Model." Training Slideshow: August 1996).

It is intended to highlight the three previously discussed differences . The concept and requirements generation for the Advanced Tactical Fighter (now the F-22) occurred in the early 1980's. The U.S. needed a replacement for the F-15 to defend against the Soviet threat. Demonstration/Validation was conducted with full scale mock-ups of a YF-22 and YF-23 version of the airplane. A "fly-off" was held in early 1990 to determine which airplane would be approved to enter development.

Originally, the F-22 production was going to be 750 aircraft. Yet, the F-22 faced numerous funding cuts throughout its development cycle. In order to weather these funding storms, and still deliver the required capability, the Systems Program Officer (SPO) reduced the number of production aircraft. By 1997, the production number was cut to 339 aircraft.

Large scale programs generally have hardware "fly-offs". In this case, each contracting team built a prototype—the YF-22 and the YF-23. These prototypes were evaluated before the Full Scale Development (FSD) phase began (FSD is now called Engineering & Manufacturing Development (EMD)). This strategy was executed to provide risk reduction in the technology development.

Another difference illustrated in Figure 8 is that the Low Rate Initial Production (LRIP) consisted of eight test aircraft. LRIP provides three functions. First, it establishes an initial production base for the system. Second, it permits an orderly increase in the production rate. Third, it provides production-representative articles for Initial Operational Test and Evaluation (IOT&E.)

Once the F-22 reaches Full Rate Production (FRP), changes can still be made to improve performance. Hardware and software maintenance will continue throughout the life of the program.

Comparing the F-22 acquisition, a defense system acquisition, to the DSCS III acquisition, a space system acquisition, as the following figure does, it becomes clearer why there was a need to supplement DoD 5000 Directives to acquire space systems that met the user's needs and at the same time follow a more logical acquisition model for space.

Satellite Acquisition/ Production Profile: (Military Communications -Wideband)

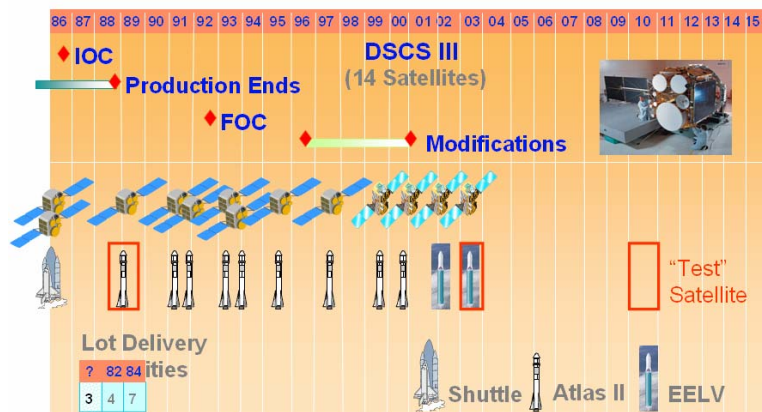


Figure 9. DSCS III Production Profile (From: National Security Space Institute.)

Figure 9 shows a historical example of a small quantity space program. It is intended to highlight several points.

Originally, the Defense Satellite Communications System (DSCS) Phase III production was to be 14 satellites. It remained 14 satellites. (The first one was launched in CY82; the remaining 13 are depicted above with their lot deliveries, launch dates and launch vehicles). The cutting of satellite constellation units would result in coverage gaps which may lead to an inability to provide the required capability. Production runs for satellite systems are very small and tend to be completed within a few (e.g. 5-8) years.

For DSCS, there was no hardware “fly-offs.” The program began in CY76 with a competition for satellite designs in CY77. There was a “Down Select” to one contractor based on paper concepts. The first launch occurred just five years later.

While there’s really no such thing as a “test article” in the space business, there was a “test” delivery of three DSCS satellites, circa CY80. All three satellites have been, or still are, operational.

When faced with funding cuts, the SPO maintained flexibility by stretching the program out. Notice the production line ended in CY88, but the last satellite was launched in CY03. That is 15 years in storage. (In actuality, the last DSCS III was in storage 21+ years)

The last four DSCS III satellites were so old, that a Service Life Extension Program was created to update them. They were completely refurbished before launch. As an interesting aside, the last DSCS III launched was a refurbished “test” satellite.

Once a satellite goes into orbit, there is no way to perform hardware maintenance on it. “Spares” are built in through redundancy. Software patches are possible, but extremely limited and time consuming to perform through the Air Force Satellite Control Network (AFSCN).³⁸

G. AIR FORCE INSTRUCTION (AFI) 65-601, VOLUME 1, US AIR FORCE BUDGET POLICIES AND PROCEDURES

This instruction contains rules and procedures for using USAF appropriated funds. It applies to resource managers at all levels and provides the broad guidelines for

³⁸ National Security Space Institute. “The National Security Space Acquisition Model.” Training Slideshow: August 1996.

financial managers to carry out their mission responsibilities. It provides guidance on budget authorization, allocations and allotments. This includes limitations on funds use required by law and limitations on funds use required by the legislative and executive branches of the federal government and the USAF on allocation documents. Limitations and budget authority guidelines are also covered in this instruction. Furthermore, this instruction provides guidance on what various appropriations can and can not buy since each appropriation has specific statutory authority. For instance, chapter eight covers procurement funding. It provides guidance on full funding, advance procurement, multiyear procurement, advance Economic Order Quantity, and Engineering Change Orders/Engineering Change Proposals.

H. AFMC INSTRUCTION 65-603, APPROPRIATION REIMBURSEMENT PROCEDURES

AFSPC did not deal with large scale acquisition processes prior to acquiring SMC in October 2001; therefore, they did not have any AFSPC instructions for these large scale acquisitions. Moreover, SMC still continues to use AFMC FAR supplements for the management of space acquisition programs, since the AFMC FAR supplement covers large scale acquisitions. Furthermore, even though SMC now falls under AFSPC, they still use AFMC instructions for acquisition related budget guidance. For instance, SMC uses AFMC Instruction 65-603 for guidance on reimbursement procedures. This instruction provides budget and accounting procedures for those cases in which AFMC organizations provide reimbursable or non-reimbursable materiel or services to DoD and non-DoD agencies, non-US government organizations, commercial organizations, and foreign governments. This instruction covers the budget office responsibilities in identifying and properly tracking reimbursements.

I. AFMC INSTRUCTION 65-605, PROGRAM MANAGER ADMINISTRATION (PMA) GUIDANCE

The purpose of this instruction is to establish consistent application of funding PMA costs for acquisition programs. PMA funding is used for mission essential program office operations in direct support of a program. PMA can be funded with RDT&E, O&M or procurement funds. This instruction is used to ensure that PMA costs are tied to the program that drives the cost. The purpose of capturing PMA funding in the

appropriate area is to ensure accountability of cost associated with a weapon system. This is to comply with Congressional intent to reflect the full cost of each weapon system providing greater cost visibility. Table 1 from AFMCI 65-605 provides guidance on PMA Allowable Support Costs.

Type of Service	Examples
1. Contract Services for Program Office Operations	Program office computer support, configuration management costs, cost estimating/analysis, and consulting services (including TEMs, CITA and FFRDC or A&AS type contracts).
2. Travel in Support of Program Office Efforts	Program office travel supporting Program Management Reviews, Negotiation Reviews, and Defense Acquisition Board (DAB). PMA procurement and RDT&E appropriation TDY funding will not be provided to higher HQ management staff for administrative reviews.
3. System Program Office (SPO) supplies and equipment purchases, rentals, leases, and maintenance.	Off-base program office space rental. Unique (above standard) equipment maintenance leases to include copiers, fax machines, on-demand repair contracts, and special graphics support.
4. Unique Communication Expenses	Program office video teleconference networks, direct long distance line with prime contractors.
5. Program Office Specific Training	Specialized short-term technical training for program office assigned personnel that directly relate to performance of functions in support of the direct mission program (e.g., Selected Acquisition Report (SAR) preparation training). This does not include funding college degrees on either full time or part time basis. Degrees are funded by host base or career program training funds.
6. Printing and Reproductions	Program office printing for DABs and Requests for Proposal (RFP).

Table 1. PMA Allowable Cost (After: Air Force Instruction 65-605, "Program Managements Administration Guide." 2003. <http://www.e-publishing.af.mil/pubfiles/afmc/65/afmci65-605/afmci65-605.pdf> (accessed 20 July 2006).

J. CONTRACTING, FINANCE AND ACQUISITION MANAGEMENT FUNCTIONAL DISCIPLINES

Space acquisition is performed by many functional disciplines; this research focuses specifically on policies and procedures within these functional areas: contracting, finance and acquisition management. Per the POTOMACON briefing, below is a brief overview of the three functional disciplines and the responsibilities that each are responsible for.

1. 64P Contracting Officers

In the acquisition community, Contracting officers are responsible for the following:

- A) Planning, organizing and directing contracting operations
- B) Select contractors, assemble contracts and make awards
- C) Advise commanders and staff on contracting operations
- D) Formulate contracting policies
- E) Create new contracts for new programs
- F) Administer existing contracts
- G) Accept final systems³⁹

2. 65F Finance Officers

In the acquisition community, Finance officers are responsible for the following:

- A) Plan, organize, develop techniques, and establish internal controls to manage financial services
- B) Advise commander and staff on status and progress of command programs
- C) Prepare, justified, and submit financial plans and budget estimates

³⁹ Air Force Personnel Center, "Acquisition Officers POTOMACON Brief," March 31, 2002

- D) Performs cost and economic analyses
- E) Develop cost estimates for programs
- F) Monitor contract performance on existing contracts⁴⁰

3. 63A Acquisition Management Officers

In the acquisition community, Acquisition Management officers are responsible for the following:

- A) Plan and organize acquisition management activities
- B) Direct programs in conceptual phases and throughout the development, manufacturing, production, deployment, and sustainment stages
- C) Manage engineering, program control, test, manufacturing, quality, and logistics support tasks
- E) Translate operational requirements to system design
- F) New Weapon Systems
- G) Upgrading existing weapon systems
- H) Manufacturing and quality oversight
- I) Manage Contractor task⁴¹

K. GOVERNMENT ACCOUNTABILITY OFFICE (GAO) REPORTS

This research is focusing on the polices and processes of space acquisition programs. Space acquisition programs have been reported by the GAO as consistently being behind schedule and over cost and not meeting performance requirements. The following are two examples of space acquisition programs that have been identified by the March 2006, GAO-06-391 “Defense Acquisitions: Assessments of Selected Major

⁴⁰ Air Force Personnel Center

⁴¹ Ibid

Weapon Programs,” as to encountering cost overruns and delays. The first is the Space Based Infrared System (SBIRS) and the second is the Evolved Expendable Launch Vehicle (EELV).

1. Space Based Infrared Radar System (SBIRS)

The Space-Based Infrared System (SBIRS) program is a culmination of several attempts to develop and deploy a follow-on capability to the successful 25-year-old Defense Support Program (DSP). Although it has proven to be a very capable system, DSP was not designed to meet the evolving theater critical and ballistic threats of the 21st century. The USAF awarded the SBIRS High Engineering and Manufacturing Development (EMD) contract to Lockheed-Martin, in November 1996, which has gone well beyond what was to be a 10-year effort and has more than doubled from its initial cost of \$4.1 billion.

The mission of SBIRS is to develop, deploy, and sustain space-based surveillance systems for missile warning, missile defense, battlespace characterization, and technical intelligence. SBIRS would be a consolidated, cost-effective, flexible system that would meet U.S. infrared space surveillance needs through the next 2-3 decades.⁴²

The SBIRS contract was awarded under the old Requirements Generation System, which is a contributing factor to the system being behind schedule and extremely over budget. According to retired Air Force Undersecretary Peter B. Teets, the system was to have its first launch in 2002 and now a tentative scheduled launch of 2008.⁴³ The initial \$4 billion contract, as of June 2004 was at \$10 billion with an estimated completion cost of \$11 to \$12 billion and with a contract completion date of 2014. Figure 10, gives a simple look at the initial cost estimate and the percentage of cost increases since the beginning of the SBIRS program.

⁴² “Air Force Link. “The SBIRS Fact Sheet”, Space and Missiles Center, October 2006. <<http://www.SBIRSRESEARCHSPACE-BASED INFRARED SYSTEM.htm>> (accessed 8 April 2006).

⁴³ N. Gaudiano. “Troubled SBIRS High Now Seen As Only Option.” C4ISR Journal. 31 July 2005. <<http://www.isrjournal.com/story.php?F=764193>> (accessed 6 April 2006).

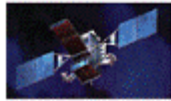
Program		Initial estimate	Initial quantity	Latest estimate	Latest quantity	Percent of unit cost increase
Space Based Infrared System High		\$4.1 billion	5 satellites	\$10.2 billion	3 satellites	315.4

Figure 10. Cost Milestone's of SBIRS Program

The most recent program manager for SBIRS at SMC in Los Angeles has been faced with numerous problems. These problems range from oversight of contractors, technology challenges, and software development problem. SIBRS has undergone several changes since it initial startup. Originally, the system was envisioned as a large system of systems comprising two constellations—one in geosynchronous orbit and another in low earth orbit—that was plagued by delays and technical problems. In 2001, the Program Manager, under the direction of Mr. Peter B. Teets, began to separate the program into stand-alone units.⁴⁴ This reorganization now consist of a ground command and control element, along with placing the SBIRS low-orbit half of the system under the Missile Defense Agency and is now known as the space tracking and surveillance system (STSS).⁴⁵ Although this reorganization will streamline the SBIRS acquisition process, and with the government regaining, control over the program, correcting past mistakes remains a systematic effort.

From 2002 to 2005 the USAF had to notify congress three times, of what informally is referred to as the Nunn-McCurdy provision, since SBIRS High crossed the 25 percent cost-growth threshold.⁴⁶ By the time the latest GAO report came out in March of 2006, the USAF had to report two more Nunn-McCurdy unit cost breaches; consequently, deciding not to buy two satellites, reducing the GEO satellites to three, one of the primary satellites and the spare.

⁴⁴ H.S. Kenyon. "Restructured Satellite Program Aims for Liftoff." Signal Magazine. 31 July 2005. <<http://www.afcea.org/signal/articles/anmvviewer.asp?a=25>> (accessed 6 April 2006).

⁴⁵ Ibid, 25.

⁴⁶ N. Gaudiano.

Due to increasing cost in space acquisition, the House of Representatives requested the GAO conduct research on “Space Acquisitions” and provide a report to the Strategic Forces Subcommittee, Committee on Armed Services, and House of Representatives. After several years of research, the GAO concluded that DoD has been unable to match resources to requirements, before beginning individual programs thus setting the stage for technical problems, which lead to cost and schedule increases. GAO suggested that DOD adopt practices that would: Separate technology development from an acquisition program, employ revolutionary approaches that pursue incremental increases in capability and guide program start decisions with investment strategies that identify overall capabilities and how to achieved them, that is, what role space will play versus other, air-, sea-, and land-based assets and priorities for funding. Figure 11, below taken from the GAO report shows a comparison between the Original Cost Estimates and Current Cost Estimates of Major Space Systems Acquisitions currently underway.⁴⁷

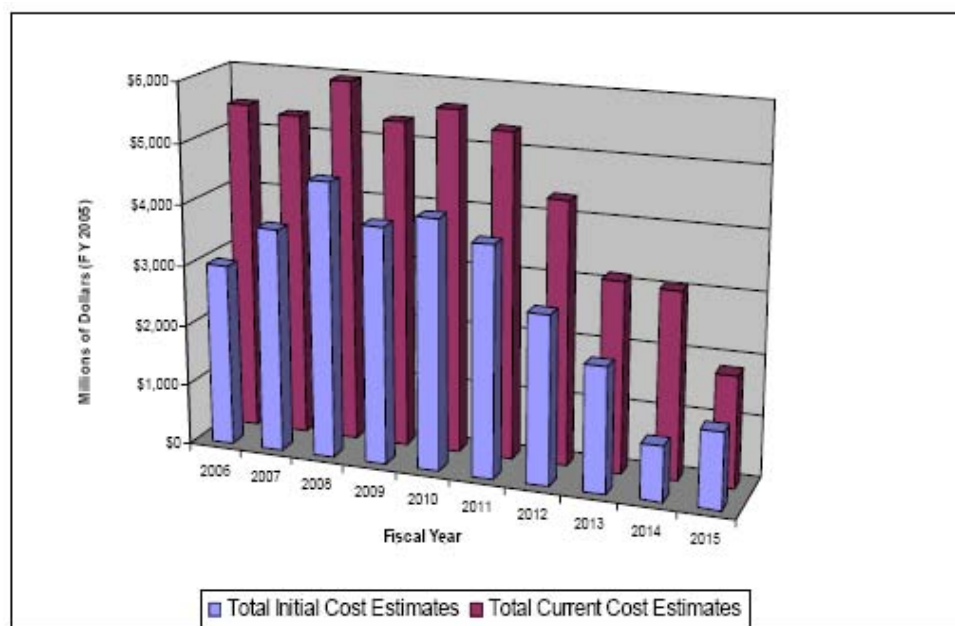


Figure 11. Original Cost and Current Cost Estimates of Major Space Systems (From: Government Accounting Office. “Space Acquisitions, Stronger Development Practices and Investment Planning Needed to Address Continuing problems.” GAO-05-891T. Washington, D.C., 12 July 2005.)

⁴⁷ Government Accountability Office. “Space Acquisitions, Stronger Development Practices and Investment Planning Needed to Address Continuing problems.” GAO-05-891T. Washington, D.C., 12 July 2005.

As Figure 11 depicts, DoD must continue to find ways, as with the establishment of the Joint Capabilities Integration and Development System, to agree up front on what capabilities are needed and how to achieve those capabilities in a timely and cost effective process.⁴⁸ Some of the lessons learned from mistakes made on programs like SIBRS, can be applied to future acquisitions by ensuring funds are available for other critical roles in national security and military operation. The lessons learned from SBIRS include paying close attention to cost that has become a higher priority than mission success, unrealistic estimates that lead to unrealistic budgets and unexecutable programs. Additionally, the lack of discipline in system requirements; and the government's space acquisition capabilities were seriously eroded. Lastly, industry failed to implement proven management and engineering practices.⁴⁹

Clearly one can see that space is completely different from other complex weapon systems and their procurement. The complexity of space systems and associated ground and launch systems are profound, thus the development challenges are intrinsic to the space industry. Most of the challenges faced today have less to do with technology than with the process by which space programs are structured and procured. It is evident that operational space is not a broken process.

2. Evolved Expendable Launch Vehicle (EELV)

The Evolved Expendable Launch Vehicle (EELV) program is a major part of the DoD space-lift modernization effort. The U.S. must maintain a robust, responsive, and resilient space transportation capability as a key to success in space borne operational capabilities, such as communications, weather, navigation, positioning/timing, intelligence, surveillance, and reconnaissance. The AF awarded the EELV development effort to both Lockheed Martin and Boeing in 1998. Through April of 2006 the program cost has risen over 81 percent.

48 Government Accountability Office. "Space Acquisitions, Stronger Development Practices and Investment Planning Needed to Address Continuing problems." GAO-05-891T. Washington, D.C., 12 July 2005.

49 M.A. Hamel. "Military Space Acquisition: Back to the Future." Air Force Space Command High Frontier. (Vol. 2 Number 2). <<http://www.afspc.af.mil/library/highfrontierjournal.asp>> (accessed 18 July 2006).

EELV was originally initiated as a FAR part 12 services contract; however it was later converted to a FAR part 15 services contract due to the commercial launch market not materializing as presumed. The intent of the EELV program started with the objective of selecting one contractor to meet the goal of reducing launch costs by at least 25 percent. In 1997 the market for launch capability showed a dramatic increase in commercial launch demand. This assessment led the USAF and U.S. space launch contractors to enter into a partnership where both contractors would provide launch services to the military and would also be allowed to sell their services to the commercial marketplace. In January 2005 the official US Space Transportation Policy stated that “for the foreseeable future, the capabilities developed under the EELV program shall be the foundation for access to space for intermediate and larger payloads for national security, homeland security, and civil purposes to the maximum extent possible.”⁵⁰

The USAF’s EELV program is less of an acquisition of equipment and more of acquisitions of commercial satellite launch services from two competitive families of launch vehicles. The Atlas V is Lockheed Martin’s effort and the Delta IV is Boeing’s effort. Each family has a number of variants depending on the lift capability necessary for each mission. The government to date has launched three satellites using EELV and the commercial sector has launched eight.

The largest contributor to the EELV cost increase is the significant decline in the commercial launch market upon which the program’s business case was based. This misjudgment about the extent to which DoD could rely on commercial demand to leverage its investment has lead to a \$12.6 billion increase. In 2004, the program experienced cost increases exceeding 25 percent, which triggered a Nunn-McCurdy provision, a statutory requirement to reassess and recertify the program.⁵¹

Due to the serious cost increase, GAO sees EELV as one of the space acquisitions programs that need serious improvements. Typical suggestions include separating technology development from the acquisition program and establishing more realistic

50 Gregory E. Wood. “Tough Decisions to Assure Access to Space.” Air & Space Power Journal, (2006).

51 General Accountability Office., “Improvements Needed in Space Acquisitions.” GAO-03-1073. Washington, D.C., September 2003.

cost estimates to create the program budget. In this instance though, it was hard to predict the commercial space-launch market collapse. In addition, DoD based many of the EELV decisions on lessons learned from past shortcuts. This time DoD would not count on one system as it did in the 1980s when it suffered a two-and-one-half year grounding of all space launches following the loss of the Challenger space shuttle.⁵²

Despite the rising costs, the U.S. sees it as essential that it retains this assured access to space. Current decisions make it obvious that part of the plan includes having two distinct launch vehicles for redundancy. The continued decline in commercial launch demand has forced the government to share the risk with launch providers through a new acquisition strategy. The USAF will contract to support each contractor's annual infrastructure through a launch capability contract and replace price-based competition with an annual award of launch service contracts.⁵³

Much has occurred in the EELV program since 1998. The cost has increased greatly, but the U.S. sees domestic space launch capability as an absolute necessity. This system is projected to provide almost all U.S. space launch capability through the year 2020 and therefore must survive current shortfalls. As with all DoD systems, cost will continue to be a major concern. The EELV program office needs to be vigilant in the oversight of its current contracts. The USAF knows that it must work hard to minimize costs while maximizing capability, but sound decisions must be made to ensure current and future domestic space launch resources are available.

L. EMERGING TECHNOLOGY

The space acquisition environment is dynamic and is constantly changing. The following are examples of the emerging trends/technologies that are being incorporated into space acquisitions. The first one discussed is Evolutionary Acquisitions (EA), which was identified by DoDD 5000.1 as the preferred approach to use in providing useful military capability to the operational user as rapidly as possible. Next is the Contracting Management Maturity Model (CMMM), which is utilized to assess an organization's

⁵² Gregory E. Wood.

⁵³ Improvements Needed in Space Acquisitions, 54.

contract management process capabilities and can also be used periodically to assess an organization's contract management process maturity. The last emerging technology discussed is the Comprehensive Cost and Requirements System (CCaRs). This system is an automated tool used by financial managers in the space acquisition community. It encompasses a comprehensive cradle to grave requirements and execution tracking tool.

1. Evolutionary Acquisitions

Evolutionary Acquisitions (EA) falls under emerging technology since it has only been used in DoD as a preferred approach since 2000. Its DoD roots however started in the early 1980s. Figure 12 shows some of the major milestones starting with a study by the Armed Forces Communications and Electronics Association (AFCEA) and formal endorsement by the Joint Logistics Commanders. The figure also shows the rigor and numerous groups of DoD agencies that looked at EA before it was finally accepted. Although only recent programs started performing acquisitions under an evolutionary approach, many past acquisitions programs have used aspects of EA.

1983	– AFCEA Study of Evolutionary Acquisition (EA) for C2 Programs
1986	– Joint Logistics Commanders Endorse EA
1987	– DSMC and JLC Publish a Guide for EA Programs
1988	– Boehm Article on Spiral Development
1990	– JLC/DSMC Recommend that EA Language be Included in 5000 Regulations
1995	– DAE Issues Guidance on the Use of EA
1996	– NCAT Recommends EA as Preferred Approach to Acquisition
1999	– Section 912 Study Team Endorses EA Approach
1999	– Chairman, JCS Endorses Time-Phased Requirements
2000	– DoD Publishes New 5000 Regulations Endorsing EA as Preferred Approach

Figure 12. Evolution of a Policy Concept (After: Sylvester R.K. and Ferrara J.A. (2003). Conflict and Ambiguity - Implementing Evolutionary Acquisitions. Acquisitions Review Quarterly).

EA is part of a greater effort to make DoD acquisitions more responsive to rapidly changing threats, and changes in technology and warfighter needs. There is also hope that this change will help increase DoD's control over program costs, program manager

accountability, and participation of high-tech firms in DoD weapon acquisition programs. The following are specific attributes that will help accomplish the above objectives:

- Get useful increments of new capability into the hands of U.S. personnel more quickly
- Take better advantage of user feedback in refining system requirements and developing subsequent increments of capability
- Mitigate technical development risk in weapon programs that are to employ new or emerging technologies
- Facilitate the periodic injection of new technology into weapons over their life cycles, so as to better keep pace with technological changes⁵⁴

One of the confusions about EA is that many use other similar terms interchangeably. Terms like Spiral Development (SD), Block Approach, and Incremental Acquisition to mention a few. The problem with this is that each term has its own unique description that makes it different and therefore adds confusion when used improperly. The following Figure 13 shows how EA and SD can go together, but notice that they are not the same concept.

⁵⁴ G. J. Pagliano and R. O'Rourke. (2004) Evolutionary Acquisitions and Spiral Development in DOD Programs: Policy Issues for Congress. Congressional Research Service Report for Congress.

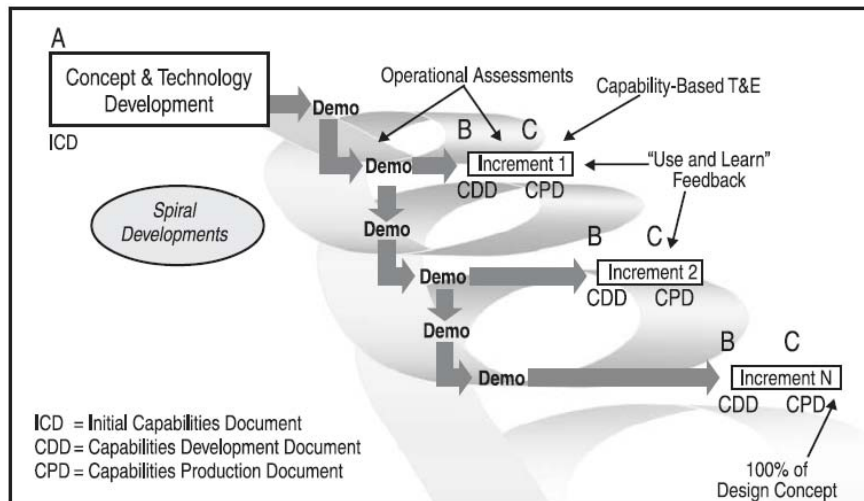


Figure 13. Evolutionary Acquisition and Spiral Development. (After: Pagliano, G. J. and O'Rourke, R. (2004) *Evolutionary Acquisitions and Spiral Development in DOD Programs: Policy Issues for Congress*. Congressional Research Service Report for Congress).

Incremental acquisition is an acquisition strategy of gradually improving a capability through a planned series of block upgrades, each of which is to be acquired and fielded. SD is a strategy for achieving a new capability through the phased development of fieldable prototypes; it may take several development “spirals” before a system is ready for production.⁵⁵ EA may use portions of each strategy depending on how mature the key technologies are and on how well defined the user’s requirements are.

DoD and Congress have also come up with specific definitions for EA and SD. EA is “an acquisition strategy that defines, develops, produces or acquires, and fields an initial hardware or software increment of operationally useful capability.” SD is “an iterative process for developing a defined set of capabilities.” A related accommodation has been to recognize that well-known and long-used program strategies, such as pre-planned product improvement and block upgrades, are themselves forms of EA.⁵⁶ This

⁵⁵ R.K. Sylvester and J.A. Ferrara (2003). *Conflict and Ambiguity - Implementing Evolutionary Acquisitions*. *Acquisitions Review Quarterly*

⁵⁶ Ibid, 22.

accommodation is important since it shows that DoD has experience with several aspects of EA and should expand on the successes of these methods.

Concentrating specifically on EA, DoD Directive 5000.1 states:

To ensure that the Defense Acquisition System provides useful military capability to the operational user as rapidly as possible, evolutionary acquisition strategies shall be the preferred approach to satisfying operational needs. Evolutionary acquisition strategies define, develop, and produce/deploy an initial, militarily useful capability (Block I) based on proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities, and plan for subsequent development, production, and deployment of increments beyond the initial capability over time (Blocks II, III, and beyond).⁵⁷

To better understand what EA does for DoD, we must compare it to the traditional acquisition method. The traditional approach is known as single step to full capability (SSFC). DoD would first define a specific performance requirement to be met. Then under SSFC, DoD would work for many years to develop and build a design that, upon first deployment, was intended to meet 100 percent of that requirement. EA on the other hand will set aside the quest for 100 percent fulfillment of the requirement in the initial version of the weapon and instead rapidly develop an initial version that meets some acceptable fraction of the requirement. Field experience with this initial version is then used to develop later increments of the weapon that meet an increasing fraction of the requirement, until a version is eventually developed that meets the 100 percent standard.⁵⁸

If used properly, EA is very applicable to space acquisitions. Space is currently on a push to a steady approach of system procurement. The DoD Directive 5000.1 explanation of EA is perfect for the things space is trying to accomplish. Core capacities for space would be built around modular space platforms, which would be produced in order to be launched on a regular cycle. This core capacity is what EA block I promises to deliver. Development of a new package would occur in parallel but would not be

⁵⁷ The Defense Acquisition Management Framework, 4.

⁵⁸ Pagliano, 2.

deployed until it was mature enough not to delay the production cycle. This subsequent development of greater capability falls under the concept of future EA increments or blocks. The bias of the acquisition system would be towards deployment with as simple a system as possible on a regular deployment schedule, which would make costs more predictable.⁵⁹

There are consequences for using EA as the preferred approach. These consequences include more upfront work being necessary; a greater role for acquirers in the requirements process and the acquisition process; and a new approach to budgeting.⁶⁰ The changes that already occurred in space acquisitions by bringing SMC into AFSPC were a perfect start for confronting the above consequences and facilitating the required interaction and coordination.

If personnel in SMC try using EA in a SD approach with immature technology and ill-defined user requirements, then chances of success will greatly diminish. As Robbin Laird (a Washington and Paris-based defense and aerospace consultant) explains, “SD has become, in practice, synonymous with the structural incapacity to launch sufficient or adequate capability at a reasonable price. The problem is requirements creep in the development stage and an overly optimistic plan for technological breakthroughs in the development cycle. To make EA work in space acquisitions, SMC must also get away from projecting technical possibilities that are simply unrealistic within the production schedules.”⁶¹

2. Contract Management Maturity Model

The Contract Management Maturity Model (CMMM) is a tool used to measure an organization’s contract management process capability and can be used periodically to

59 R. Laird (2006). “OpEd: Fixing Space Acquisition: From Spiral Development to Cookie-Cutter Production.” Space News Business Report. <http://www.space.com/spacenews/archive06/Laird_021306.html> (assessed 06 October 2006).

60 10. Sylvester

61 1. Laird

assess an organization's contract management process maturity. The results of the assessment may be used as a road map to improve the organizational contract management process capability.⁶²

This model is used to help the buying and selling organizations focus on key areas of process improvement. Furthermore, it helps the organization assess the major steps they need to accomplish when buying or selling products, services and integrated solutions to the public or private business sectors. The CMMM reflects five levels of maturity. A maturity level refers to a level of organizational capability created by the transformation of one or more domains of an organization's processes. These five levels are ad-hoc level (Level 1), basic (Level 2), structure (Level 3), Integrated (Level 4) and Optimized (Level 5).⁶³ By identifying these five maturity levels in an organization, it will allow the organization to obtain the capability and effectiveness in its contract management processes. By using the CMMM, an organization has the ability to look into its contract management processes and dissect them into six key processes. These six processes are the "cradle to grave" steps for a buying organization in contracting. They include, procurement planning, solicitation planning, solicitation, source selection, contract administration, and contract closeout. For a selling organization they include, presales activity, bid/no-bid, bid or proposal preparation, contract negotiation and formation, contract administration and contract closeout. Each of the buyer and seller key processes reflects the tools, techniques and proven best practices that a leading organization would use in their respective contract management processes.⁶⁴

As the USAF is faced with the Global War on Terrorism, it has begun to look at the transformation of its acquisition environment. Currently, the USAF acquisition environment is rapidly changing the way it does business to deliver capability faster and at a lower cost. The acquisition community is dedicated to getting an operational,

62 G.A. Garrett and R.G. Rendon (2005). Contract Management Organizational Assessment Tools, National Contract Management Association. McLean, VA.

63 Ibid, 48-50.

64 G.A. Garrett and R.G. Rendon (2005). Contract Management Organizational Assessment Tools, National Contract Management Association. McLean, VA.

suitable, effective, best value and affordable product to the warfighter, in the least amount of time. In order to do this it has to rethink its business processes.

In late 2001 with the recommendation of the Space Commission to realign SMC under AFSPC, many changes had to take place in the organizations contract management processes. SMC was affected by this realignment, and along with the big contractors that build the space assets. To assist both of them in this realignment the CMMM could be utilized in analyzing their contract management processes.

3. Comprehensive Cost and Requirements System (CCaRS)

CCaRs is an automated tool used by financial managers in the space acquisition community. It encompasses a comprehensive cradle to grave requirements and execution tracking tool. CCaRs is a comprehensive database that pulls information from the budget query (BQ) financial system: General Accounting and Finance System (GAFS), and the Web-Based Automated Business Services System (ABSS). It provides automated budgeting, cost estimating, budget execution, contract management, reconciliation and reporting tools.

As a budget tool, CCaRs has the ability to track the Planning, Programming and Budgeting System (PPBS) Cycle and assign budget amounts to thoroughly defined requirements. It tracks budget authority as appropriated funds are loaded into the financial systems. Furthermore, it helps ensure compliance with the Anti-Deficiency Act Compliance by tracking programmable quarterly allotments. It also allows managers to prioritize and approve requirements through an electronic coordinated workflow process. This in turn gives Project Officers/Resource Advisors the tool to verify if their requirements are funded and/or where they stand on the unfunded priority list.

CCaRs also provides analyst with cost estimating features, to aid in budget request validation. The system has an Excel spreadsheet attached that provides the cost estimators with the foundation for a detailed estimate. For instance, all requirements loaded in the system include a basis of estimate that is tied to the fiscal year budget requests. All estimates are reviewed during coordination and assigned a confidence rating. Furthermore, the system stores historical estimates for future cost estimating.

CCaR's budget execution capabilities provide increased efficiency for budget analyst through time saving features. CCaRs in essence provides a one stop shop for budgetary data. It supports all DoD funding documents (also electronic signatures). For example, funding documents created in CCaRs are electronically submitted to ABSS. Through the interface with ABSS, CCaRs automatically identifies certified documents. Individuals can also coordinate on ABSS documentation through CCaRs. The system also aids analyst in obligation and expenditure forecasting. It has the ability to define baseline and revised forecasts and can track contract and non-contract obligations and expenditures. Additionally, analyst can see the original commitment document linked to obligations and expenditures in CCaRs.

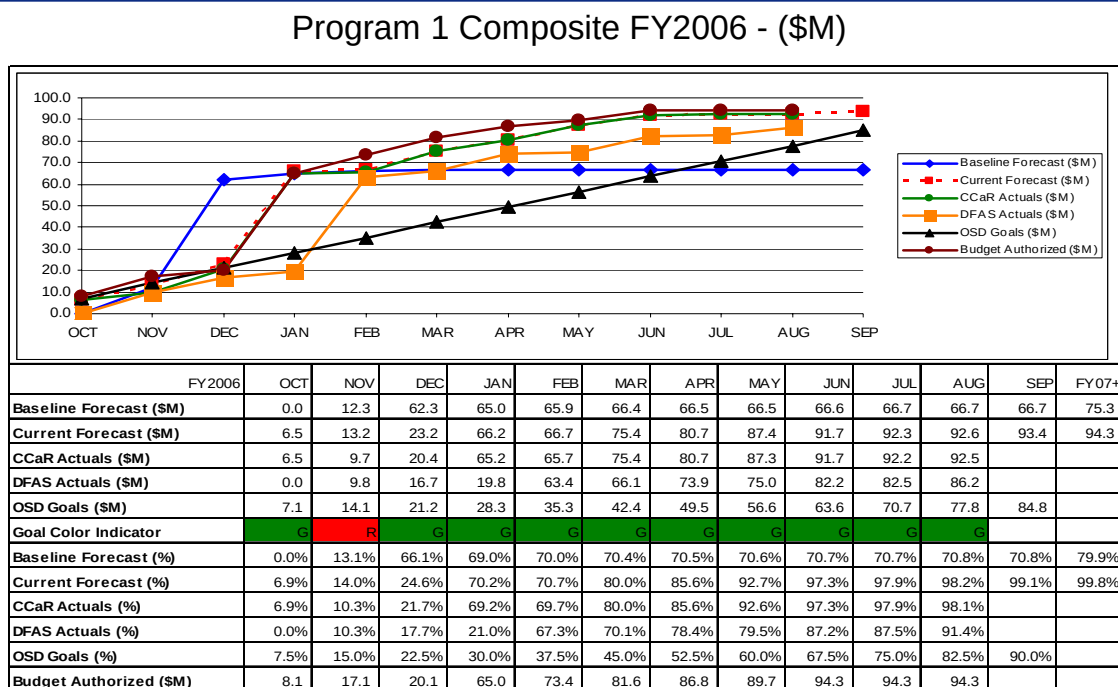
CCaRs also benefits the entire space acquisition community with its contract management tool. This tool provides baseline and consolidated contract data. The system supports 'C' type and delivery order contracts. Furthermore, it can track Section B and Section G information by modification and track obligations at the CLIN and ACRN level for each modification and each voucher processed. The system also has the ability to display total obligations and expenditures by a particular CLIN or ACRN. This information can help in contract reconciliation efforts.

CCaRs also provides budget analyst with information to aid in reconciliation of funding records. The system is able to identify and highlight Defense Finance Accounting System (DFAS) discrepancies. As with ABSS, CCaRs interfaces with GAFS. DFAS commitments, obligations and expenditures are automatically linked to CCaRs positions. Furthermore, CCaRs stores historical transactions that have been purged by DFAS for future financial reference.

Through the interfaces with the various financial systems and the stored data, CCaRs provides analyst with the capability to analyze and report on financial information in a timely manner. CCaRs allows analyst to view budget execution data and funding requirements at various levels. For instance, the analyst can analyze the data at a rolled up level or at detailed line item level. The flexibility in CCaRs allows for an efficient and effective budgetary analysis. Budget analysts also use CCaRs to generate charts for budget briefs. These charts are automatically produced in PowerPoint format and all data

can be further edited within PowerPoint. Some examples of charts produced in CCaRs are the spotlight, snake, obligation event timeline and expenditure event timeline. Figure 14 shows an example of an expenditure snake chart. This feature is extremely beneficial to budget analyst in that all the data from briefings can be automatically pulled from one system and time is not wasted on gathering data and spending time putting charts together.

Obligation Snake Chart



Computer Generated by CCaR

30-Aug-2006

Figure 14. Obligation Snake Chart (After: Ironfield Briefing.)

Not only does CCaRs provide PowerPoint charts but it also has query tools that allow users to build custom and complex reports that can be exported to Excel spreadsheets. Some of the budget reports than CCaRs can generate are effects of budget cuts, schedule slips and requirement increases.

CCaRs is an effective tool for budget analyst to use in their day to day operations. It saves valuable time with its ability to interface with various systems and generate budgetary charts and reports. It also provides program oversight by highlighting funding discrepancies between ABSS and DFAS.

M. GAO ASSESSMENT FRAMEWORK MODEL

As the federal budget has been spread thin to cover the ever increasing national defense missions, it is imperative that defense dollars are utilized in an efficient, effective and accountable manner. In today's environment, contractors have become viable participants in meeting national defense missions. For instance, hundreds of billions of dollars are spent annually on contractor provided goods and services for DoD. However, assessments from the GAO, Inspectors General (IG) and other accountability organizations continue to identify systematic weaknesses in key areas of acquisitions.⁶⁵ With not enough money to cover all the needs of the military, it is crucial that DoD use every dollar wisely.

To improve the federal government's ability to acquire goods and services in a cost effective manner GAO published GAO-05-218G, "Framework for Assessing the Acquisition Function at Federal Agencies" in September 2005. Federal employees and industrial experts provided GAO with information related to human capital, information management, financial management and acquisition practices. GAO used this information along with information gathered within the experienced GAO community to develop the assessment framework. The objective of the assessment framework is to provide federal agencies with a tool in conducting an assessment of the strengths and weaknesses of their acquisition functions. The foundation of the assessment framework was built with the concept of management's responsibilities as they relate to internal controls, to include plans, methods and procedures used to meet agencies missions, goals and objectives. The assessment framework consists of four cornerstones:

⁶⁵ General Accountability Office. "Framework for Assessing the Acquisition Function at Federal Agencies." GAO-05-218G. Washington, D.C., September 2005.

1. Organizational Alignment and Leadership
2. Policies and Processes
3. Human Capital
4. Knowledge and Information Management

The GAO assessment believes these four cornerstones are essential to an efficient, effective, and accountable acquisition process. The cornerstones were established to be interrelated to support an integrated evaluation of an organization. However, the assessment framework also allows each cornerstone to stand alone and be evaluated independently. This gives agencies the flexibility to tailor the evaluation to their organizational needs.

To assist agencies in evaluating their organizations GAO has broken down each cornerstone into elements and critical success factors. The elements are an integral part of the organizational effectiveness of the cornerstone it stems from. To analyzing each element, GAO has provided critical success factors. These success factors focus on program results and mission accomplishment. The presence of the critical success factors indicates that the organization will have an increased ability to consistently achieve their desired acquisition objectives. However, if the critical success factors are absent it may indicate that the organization has areas with high risk or areas that need additional management attention. Figure 15 illustrates the Framework for Assessing the Acquisition Function.

Cornerstones	Elements	Critical Success Factors
Organizational Alignment and Leadership	Aligning Acquisition with Agency's Missions and Needs	• Assuring Appropriate Placement of the Acquisition Function • Organizing the Acquisition Function to Operate Strategically • Clearly Defining and Integrating Roles and Responsibilities
	Commitment from Leadership	• Clear, Strong, and Ethical Executive Leadership • Effective Communications and Continuous Improvement
Policies and Processes	Planning Strategically	• Partnering with Internal Organizations • Assessing Internal Requirements and the Impact of External Events
	Effectively Managing the Acquisition Process	• Empowering Cross-Functional Teams • Managing and Engaging Suppliers • Monitoring and Providing Oversight to Achieve Desired Outcomes • Enabling Financial Accountability
	Promoting Successful Outcomes of Major Projects	• Using Sound Capital Investment Strategies • Employing Knowledge-Based Acquisition Approaches
Human Capital	Valuing and Investing in the Acquisition Workforce	• Commitment to Human Capital Management • Role of the Human Capital Function
	Strategic Human Capital Planning	• Integration and Alignment • Data-Driven Human Capital Decisions
	Acquiring, Developing, and Retaining Talent	• Targeted Investments in People • Human Capital Approaches Tailored to Meet Organizational Needs
	Creating Results-Oriented Organizational Cultures	• Empowerment and Inclusiveness • Unit and Individual Performance Linked to Organizational Goals
Knowledge and Information Management	Identifying Data and Technology that Support Acquisition Management Decisions	• Tracking Acquisition Data • Translating Financial Data into Meaningful Formats • Analyzing Goods and Services Spending
	Safeguarding the Integrity of Operations and Data	• Ensuring Effective General and Application Controls • Data Stewardship

Figure 15. Framework for Assessing the Acquisition Function (From: Government Accountability Office. “Framework for Assessing the Acquisition Function at Federal Agencies.” GQO-05-218G. Washington, D.C., September 2005.)

In the assessment framework, GAO has also provided three indicators to help organizations determine if they are effectively employing the critical success factors. The first indicator is ‘key questions.’ These questions are provided to help organizations determine the presence or absence of critical success factors. The next indicator is the

“situations to look for.” This area provides examples of activities and practices that signify good acquisition outcomes. The last indicator provided in the assessment framework is the “cautions.” This area is the opposite of “situations to look for” and provides examples of activities and practices that could be damaging acquisition outcomes. Appendix 4 illustrates the three indicators (key questions, situations to look for, and cautions) for each critical success factor utilized in this research.

N. SUMMARY

In conclusion, this chapter gave a brief overview of current acquisition policies, a look into two space systems with cost overruns and delays. It identified several emerging technologies that are being utilized to assess current procedures and ways of tracking and analyzing cost data. Lastly, the GAO assessment framework was introduced as a way to assess acquisition processes, based on information gathered from numerous DoD agencies and studies.

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III. CASE STUDY APPLICATION

A. CHAPTER OVERVIEW

This chapter will give a brief history of AFSPC and SMC, it will convey the mission of both organizations. Furthermore, it will give insight to how the AFSPC command structure is organized as well as that of SMC. Additionally, this chapter will introduce the research method, collect evidence, generate questions and analyze evidence.

B. AIR FORCE SPACE COMMAND

1. AFSPCs History

AFSPC is headquartered at Peterson Air Force Base, Colorado and became known by this name in 1985. However, its origin dates back to 1982 when it was activated as the “Space Command”. In these early days, “Space Command” was organized to manage missile early warning systems and space tracking systems, later taking on space surveillance and missile warning sites around the world. Upon being renamed to its current name of AFSPC, it assumed responsibility for commanding, controlling and receiving telemetry information from a variety of military satellites. In addition, it doubled in size and was put in charge of acquiring space launch capabilities and control of the nations Intercontinental Ballistic Missiles (ICBM). In October 2001, the command assumed the SMC at Los Angeles AFB from the AFMC. This move brought to the command responsibility for the development and acquisition of space and missile systems, thus merging these tasks within a single operations and acquisition function.⁶⁶

In April 2002, AFSPC became a separate four-star Air Force Command with the designation of the AFSPC Commander as a four-star position, thus making it distinct

⁶⁶ Air Force Link. “Air Force Space Command Almanac 2004-2005”,
<<http://www.afspc.af.mil/shared/media/document/AFD-060316-011.pdf>> (accessed 20 September 2006).

from the commanders of U.S. Space Command and NORAD. As the USAF's Executive Agent for Space, AFSPC advocates space capabilities for all unified commanders across the services.⁶⁷

AFSPC's primary purpose is to defend the U.S. through its satellites and ICBM's. The Space Force Mission is to defend the U.S. through the control and exploitation of space. AFSPC's direct annual budget authority is approximately \$3.2 billion. Approximately 40 thousand people, including 27.1 thousand military members and civilians, and 13.7 thousand contract employees, combine to perform AFSPC missions.⁶⁸

2. AFSPC's Mission

AFSPC's role is to ensure reliable access to space is made to the war fighter. In addition, they use ICBM's forces to deter any adversary contemplating the use of weapons of mass destruction. AFSPC has five primary mission areas:

- 1) Space support by using expendable launch vehicles to launch satellites, and other high-value payloads into space, and control them once in space.
- 2) Conduct counterspace operations, which encompass surveillance, negation, and protection.
- 3) Provide force enhancement to the war fighter through weather, communications, intelligence, missile warning and navigation.
- 4) Space force application by maintaining and operating a rapid response, land-based ICBM force as the USAF only on-alert strategic deterrent.⁶⁹
- 5) Mission support is focused on the basic resources necessary to support AFSPC systems and personnel.

⁶⁷ Air Force Space Command Almanac, 5.

⁶⁸ T.A. Mehuron, AF Almanac, Air Force Magazine, <<http://www.afa.org/magazine/May2006/default.asp>> (accessed 1 September 2006).

⁶⁹ Air Force Link. "SMC Link." 2005. http://www.losangeles.af.mil/SMC/smc%20msn_vsn.doc (accessed 16 May 2006).

C. SPACE AND MISSILES SYSTEM CENTER

1. SMCs History

SMC originated in 1954 as the Western Development Division (WDD) of the Air Research and Development Command. The Division's original mission was to develop ICBMs; as this was a top military priority due to the Soviet Unions race to do the same. Soon, thereafter they were given the added responsibility of developing the first military satellite system. In 1957, WDD was redesignated as the Air Force Ballistic Missile Division (AFBMD). The AFBMD was given sole ownership of development of military space systems, with the exception of the NRO, which was responsible for reconnaissance satellites and related systems. By 1961, AFBMD had two parallel missions, yet it seemed unclear if the missiles and space systems belong together. Thus, due to increasing importance of space systems AFBMD was inactivated and replaced by the Ballistic Systems Division (BSD) and Space Systems Division (SSD).⁷⁰ Over the course of the next several decades, these two divisions went through numerous reorganizations and redesignations. Finally, by 1992 they were redesignated as the Space and Missiles System Center (SMC) that is still activated today and located at Los Angeles AFB, California.

Today, SMC is the home of the USAF's premier space acquisition center of technical excellence for researching, developing, and purchasing military space systems. SMC is developing, building, fielding, and supporting satellites and launch vehicles that represent the largest space program in DoD. The center is also responsible for on-orbit check-out, testing, sustainment, and maintenance of military satellite constellations and other DoD space systems. SMC has an annual total budget in excess of \$6.5 billion per year and employs 1.6 thousand military members, 1.2 thousand civilians and an estimated 900 contractors worldwide. It manages between \$50 and \$60 billion in contracts at any one time and manages 12 major programs and/or functional systems.⁷¹

⁷⁰ Air Force Link. "History Office of the Space and Missiles System, history of the high ground." 2005. ><http://www.losangeles.af.mil/SMC/HO/INDEX.HTM>> (accessed 20 September 2006).

⁷¹ History Office of the Space and Missiles System, history of the high ground.

As previously mentioned in Chapter II, in January 2001, the Space Commission stated the importance of the USAF's management of space programs and recommended the realignment of SMC from AFMC to AFSPC, thus bringing developers and operators of military space systems together under one major command and signifying a significant change in the management of military space programs.⁷²

2. SMCs Mission

The mission statement at SMC is to “deliver unrivaled space, missiles and information capabilities and systems to the joint war fighter and the nation”.⁷³ SMC is the technical center of excellence for researching, developing, and acquiring military space systems. Their primary mission areas are:

- 1) Acquire, deliver and sustain effective and affordable space and missile systems that exceed war fighter needs.
- 2) Evolve and synchronize ground systems to support current and future space and joint war fighter requirements.
- 3) Lead the way in developing Responsive Launch and Joint War fighting Space (JWS) capabilities.
- 4) Acquisition Excellence, meaning re-engineer and improve internal business and operations processes, hone their acquisition capabilities to better control costs, meet schedule and achieve technical performance requirements.⁷⁴

The SMC mission can be better understood by looking at Figure 16. The usual space mission event is the launch of a payload into the earth's orbit. This event consists of six segments, which can be separated into two parts: the launch vehicle and the space system. Both parts have the following segments: space, ground support and terminal. SMC supports the conceptualization, acquisition, and the technical /engineering

⁷² Air Force Link. “SMC Link.” 2005. http://www.losangeles.af.mil/SMC/smc%20msn_vsn.doc (accessed 16 May 2006).

⁷³ Ibid.

⁷⁴ Ibid.

development and execution of all six segments. Additionally, these events are supported by a global infrastructure that consists of launch, range, and sensors. SMC's strategic goal in all of this is to make the space mission execution, ground support, and launch affordable, reliable and a routine for the war fighter.

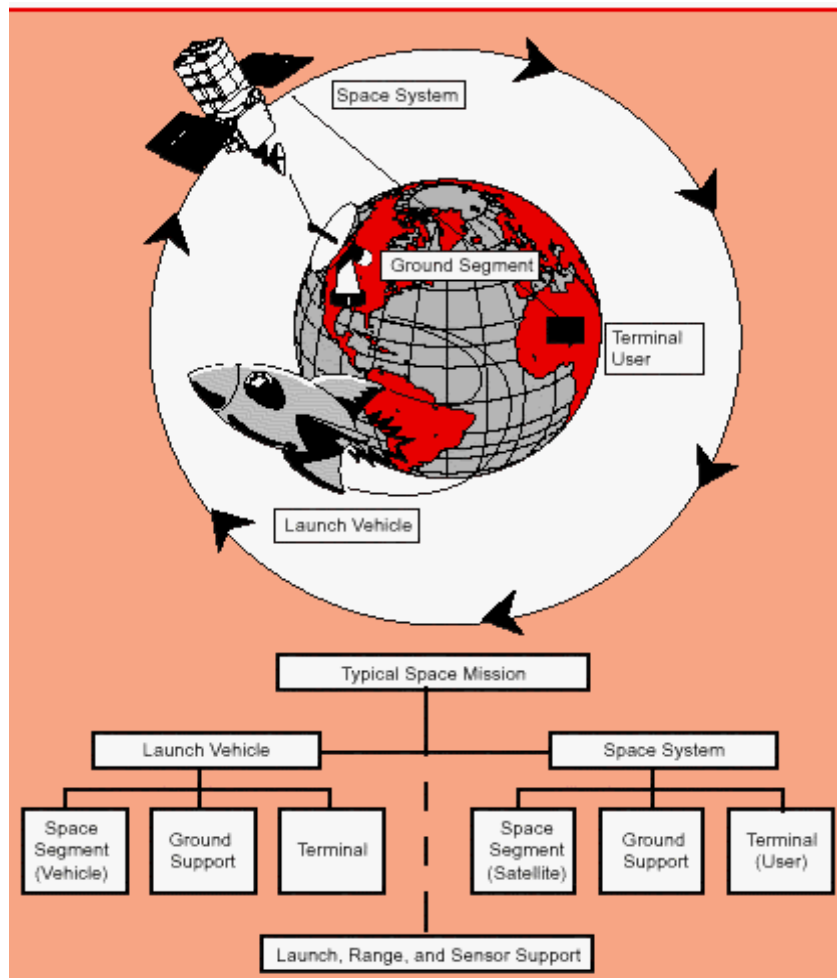


Figure 16. Typical Space Mission (From: "The Environmental Publication of the Air Force Space Command Frontiers." *Frontiers*, January 2002).

3. SMC's Organization after Realignment in AFSPC

SMC was realigned from AFMC and placed as a subordinate unit under AFSPC on October 1, 2001. Figure 17 shows the realignment of SMC from AFMC to AFSPC, showing the increased in responsibility AFSPC acquired.

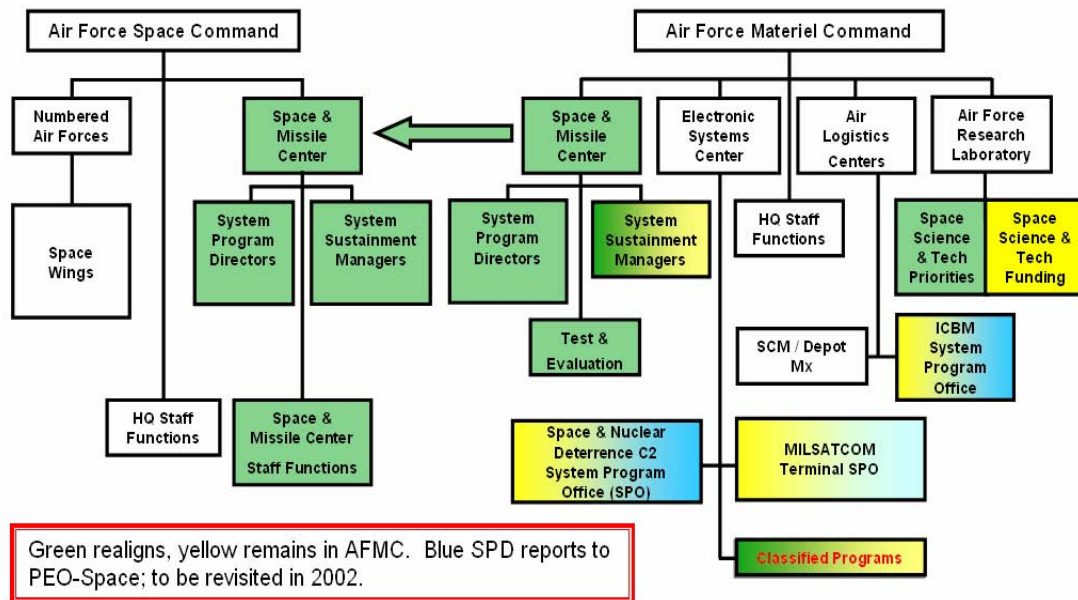


Figure 17. SMC Realignment (After: Mueller, J. "Commission to Assess United States National Security Space Management and Organization Brief." August 2001.)

4. SMC's Organization

In July 2006, SMC reorganized and renamed its organization to mirror the traditional USAF structure. This reorganization was to increase effectiveness and provide a command authority to develop, acquire and sustain military space power. With this realignment came the activation of six subordinate acquisition wings, 21 groups, 12 squadrons, 20 divisions, two system offices and the 61st Air Base Wing.

The six renamed subordinate wings in figure 18 include the following: Military Satellite Communications Systems Wing, Launch and Range Systems Wing, Global

Positioning Systems Wing, Space-Based Infrared Systems Wing, Satellite Control and Network Systems Group, and Defense Meteorological Satellite Program Systems Group.⁷⁵

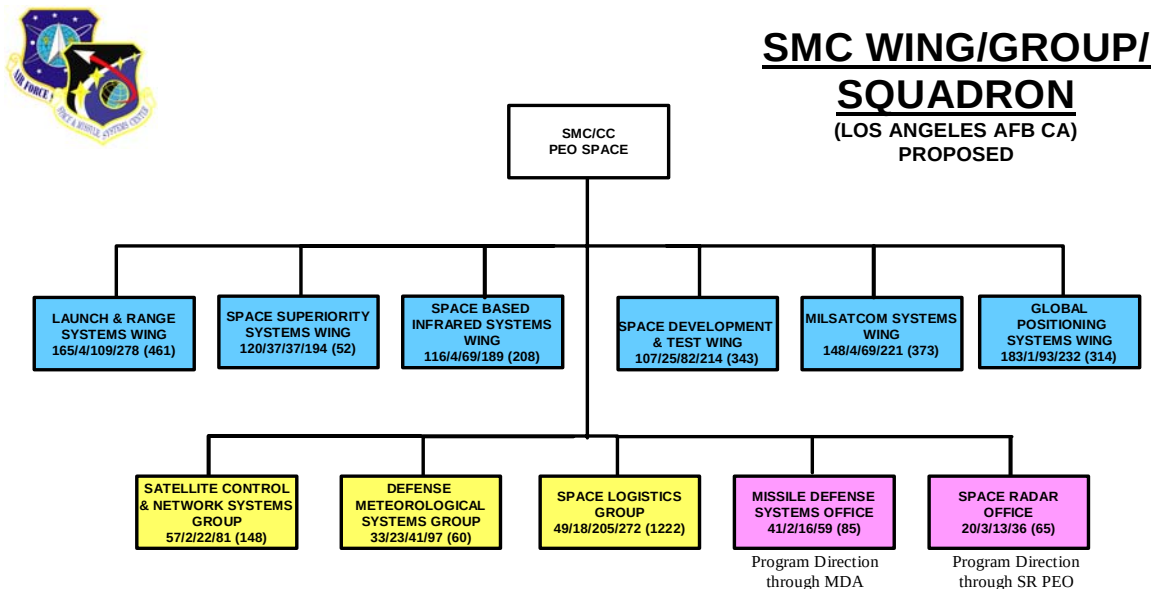


Figure 18. New SMC Wing and Group Organizational Chart (After: Leeman, William S. “Final ASU Organizational Chart.” Slideshow: 2006)

D. GAO ASSESSMENT FRAMEWORK

To analyze Space Acquisitions, the GAO’s “Framework for Assessing the Acquisition Function at Federal Agencies” was utilized. As mentioned in Chapter I time limits the ability to research every cornerstone. This research paper was narrowed down to an analysis of A.F. Space Acquisitions using the cornerstone of “Policies and Practices.” More specifically, it concentrates on the element “Effectively managing the Acquisition Process.”

According to the GAO assessment framework, the cornerstone “Policies and Practices” represents the basic principles that govern the way an agency performs

⁷⁵ Air Force Print News Today, “New Structures, names for SMC organization”, 4 Aug 2006.
<http://www.military.com/MilitaryCareers/Content/0,14556,MPDC_AirForce_All_News_080706_11,00.html>
(accessed 7 August 2006).

acquisition functions. Having effective and efficient policies and processes in place can help improve an organization's acquisition outcomes. To be efficient, policies and processes need to clearly define the roles and responsibilities of organizational members. To be effective policies and processes need to empower organizational members at all levels. This will allow for the most effective procurement of goods and services. Also, to be effective, policies and processes need to be in place to allow/encourage open communication across departments. In order to be successful, all departments need to be involved in the planning and managing of the acquisition process. After all each department has a contribution in accomplishing the acquisition mission. Without effective and efficient policies and processes in place, an organization can miss opportunities to achieve savings. Furthermore, weak policies and processes in place can cause work redundancy and cost overruns.

The GAO assessment framework provides three elements under the Policies and Process cornerstone. However, due to time limitations this analysis was narrowed down to focus on the element, "Effectively Managing the Acquisition Process." This element emphasizes the fact that the acquisition process does not end once a contract is awarded. It is important to monitor the process throughout to ensure that goods and services are delivered according to the schedule, cost, quality and quantity agreed upon when the contract was awarded. The GAO assessment framework provides four critical success factors to guide in an assessment of the "Effectively Managing the Acquisition Process" element.

1. Empowering Cross-Functional Teams

Monitoring the process takes various functional disciplines in the Acquisition community; which emphasizes the need for "empowering cross function teams". In fact, this is one of the critical success factors provided by the GAO in the assessment framework under the element "Effectively Managing the Acquisition Process." To manage the acquisition process effectively management needs to ensure cross functional teams are utilized. By having individuals from different functional disciplines on a team facilitates the right mix of knowledge, technical expertise and credibility. According to the GAO assessment framework, "Teams are responsible for analyzing spending data,

identifying and prioritizing potential opportunities for more detailed review, defining internal needs and requirements, and conducting market research.”⁷⁶

2. Managing and Engaging Suppliers

The second critical success factor given under this element is “Managing and Engaging Suppliers.” This critical factor helps an organization determine if they have a successful relationship with suppliers. Good relationships with suppliers in acquisition organizations can lead to lower costs, higher quality, and shorter product design and delivery time. The GAO framework provides four strategies to help develop effective supplier relationships within the context of the FAR.

1. Establishing effective supplier relationship management as a core business Strategy
2. Employing rigorous supplier selection to create a strong supplier base
3. Establishing commodity managers to more effectively manage key goods and services.
4. Establishing and maintaining an effective communication and feedback system with suppliers⁷⁷

3. Monitoring and Providing Oversight to Achieve Desired Outcomes

The third critical success factor used in this analysis is “Monitoring and Providing Oversight to Achieve Desired Outcomes.” To accomplish this effective and efficient policies and processes need to be in place to ensure that trained personnel are in the positions to oversee the contractors and their requirements. Management within Space Acquisition needs to ensure that contractors are monitored throughout the entire acquisition process to ensure AFSPC is receiving the needed goods and services from contractors. One process that is available to AFSPC to accomplish this is the EVM process. EVM is one method DoD uses to monitor large projects’ process toward cost, schedule and performance goals.

⁷⁶ Framework for Assessing the Acquisition Function at Federal Agencies, 16.

⁷⁷ Framework for Assessing the Acquisition Function at Federal Agencies, 18.

4. Enabling Financial Accountability

The last critical success factor under the element being analyzed is “Enabling Financial Accountability.” As the DoD budget continues to be heavily strained, smart financial accountability is essential in defending and requesting funding for a program. In the acquisition community, a program’s financial information should be traceable from conception to completion. The financial information needs to be useful, relevant, timely and reliable, otherwise the time spent gathering, analyzing and disseminating the information, is wasteful and leads to inefficient business practices. Furthermore, it is vital to the organization’s overall mission that financial information be communicated throughout the entire organization (all levels and cross functional teams).

E. COLLECTION OF EVIDENCE

To have an understanding of how well AFSPC is doing with policies and processes the research team conducted a literature review, gathering evidence by reviewing recent GAO reports and articles on SBIRS and EELV and development of a questionnaire. The questionnaire was used to gather information from top-level members and working- level members from the six system wings at SMC.

A discussion/GAO assessment of the acquisition process of the problematic SBIRS and EELV systems allowed the research team to obtain a rich account of the events that took place and the policies and procedures in place at that time. This method “paints a picture” by providing documented analysis and interviews. The questionnaire developed by the group provided a written list of questions that was given to a large number of people via a survey, where many of the possible answers are pre-coded, so that the questions can be answered quickly and the responses subsequently analyzed using numerical methods.

F. QUESTIONS GENERATED

Upon reviewing many of the policies and processes presented in the literature review, the team developed the questionnaire based on the acquisition framework published by GAO that was introduced in Chapter II. The team felt the GAO assessment framework would provide a systematic method for evaluating the acquisition

organization as it was based on studies and reports from numerous DoD agencies, federal agency inspector general offices and several other government agencies. The questionnaire focused on the Policies and Processes cornerstone, which was constructed based on only one of the elements, “Effectively Managing the Acquisition Process”. As previously stated in Chapter I, each of these cornerstones can stand alone for evaluating an organization. The team felt that it would be beneficial to distribute the questionnaire to the six system wings within SMC; however, limitations would be placed on who would receive the questionnaire.

The team met with subject matter experts, discussed the questions, and determined the focus of the research would be a qualitative exploratory study. As a result of the meeting, the team agreed to develop a questionnaire using the “Likert Scale Method”. This method is to present a series of statements to the respondent. The questionnaire is not a quantitative statistically significant developed questionnaire. This questionnaire is an exploratory assessment tool used to acquire feedback from the SMC workforce. The respondent is asked to indicate their degree of agreement with the statement. The team used a five point scale as follows: (1) Definitely Agree, (2) Disagree, (3) Neither agree or disagree, (4) Agree, and (5) Definitely Agree.

Next, the team met with a member of the SMC senior leadership to organize dissemination of the questionnaire to the six system wings at SMC. We concluded that the questionnaire should be anonymous and taken by USAF military and civil service personnel who work as Program Directors and Functional Directors of the system wings. The distribution of the questionnaire was engineered to cover all available SMC Program Directors or Functional Directors. The questionnaire was disseminated via a web link sent through the internal e-mail system. Results of the questionnaire were accumulated instantly in a survey database and were immediately available for analysis. The team gave the participants two weeks to submit replies. The data from the questionnaire was used to assess the strengths and weaknesses of SMC’s policies and process. Based on the responses the team highlighted areas of strengths and weaknesses and provide recommendations to SMC senior leadership.

G. SUMMARY

This chapter described the organizational history and the research objective of this study. Furthermore, it discussed the methodology developed to conduct the research design, collection of evidence, questions generated and evidence analyzed. The next chapter will discuss the results of the findings.

IV. ANALYSIS OF RESEARCH

A. OVERVIEW

This chapter will discuss the findings from the questionnaire obtained from SMC personnel. To best analyze the information from the questionnaires collected, the raw data was split into four critical success factors and by functional disciplines as seen in Figure 19.

CRITICAL SUCCESS FACTORS	FUNCTIONAL DISCIPLINES
1. Empowering Cross-Functional Teams	1. Acquisitions
2. Managing and Engaging Suppliers	2. Contracting
3. Monitoring and Providing Oversight to Achieve Desired Outcomes	3. Finance
4. Enabling Financial Accountability	4. Other

Figure 19. Questionnaires' Critical Success Factors and Functional Disciplines

This way we can find out how personnel view their organization in the four distinct factors of study and we can draw similarities and differences between how acquisitions, contracting, finance, and other personnel rate their organization.

B. SETUP AND ANALYSIS

There were 30 responses to the questionnaire. 14 people most closely associated themselves with the Acquisitions Management functional discipline. Four people most closely associated themselves with the Contracting functional discipline. Seven people most closely associated themselves with the Finance functional discipline. In the "Other" category, we had an Engineer, a Systems Engineer, a Cost Analyst, an Administrative respondent and a Sustainment respondent.

The results that follow are based on the 5-point scale discussed in Chapter III. The scores have been normalized so that for every question with a low score correlates to a negative perception of the policies and processes with the organization and a high score

correlates to a positive perception of the policies and processes. The analysis that follows focuses strictly on the means calculated for each section and on the cumulative means. A score of 1 is the lowest score attainable and a score of 5 is the highest score attainable of the questionnaire responses. The numeric results for the entire questionnaire are available in the appendix.

C. RESULTS

1. Empowering Cross-Functional Teams

The critical success factor of Empowering Cross-Functional Teams started the questionnaire by asking SMC personnel to rate statement number 2: “Our organization uses cross-functional teams in performing acquisitions activities.” Every functional discipline rated this statement as its highest agreement. Overall, the respondents gave statement 2 a mean score of 4.57. The other statement that everyone rated high was statement number 4, “I feel empowered to make decisions that affect the projects outcome.” This statement received a mean score of 4.03. The most negative statement from this critical success factor was statement 10 with a mean score of 3.30. The statement read, “There are incentives in place to encourage my team to meet project goals.” Two of the feedback write-ups in the questionnaire specifically addressed statement 10. These write-ups read, “Available concrete incentives are very limited in most cases.” and “Program office substitutes constant pressure to achieve deadlines without any incentives or recognition of hard work to meet deadlines.”

Acquisitions personnel gave statement 2 a mean rating of 4.36. The other statement that Acquisitions personnel rated high was statement number 4. This statement was given a mean rating of 4.00 by this functional discipline. The lowest mean score given by Acquisitions personnel was 3.36 for statement number 10. For this critical success factor the Contracting personnel had scores relatively close to the scores of the Acquisitions community. They gave statement 2 and 4 a mean rating of 4.50 and 4.25 respectively, and they gave statement 10 their lowest mean rating of 2.50.

On the other hand, Finance personnel had their second highest mean scores with statement 3 and statement 5. These read: “We involve staff from field offices in acquisitions decisions.” and “I use a project plan to manage and control implementation

of projects.” The mean score for both of these statements was a 4.00. This functional discipline gave statement 6 and 8 their lowest scoring. These read: “My project’s plan uses performance measurement baselines for schedule and cost.” and “My project’s plan uses performance measurement baselines for risk associated with the project.” The mean score for both of these statements was a 3.14.

The “Other job” categories were consistent with the Acquisitions personnel by giving statement 4 a 4.40 but individually they also liked statement 7; which reads, “My project’s plan uses performance measurement baselines for major milestones and target dates.” They gave this statement a mean score of 4.40. This functional discipline rated statement 9 lower than the other functional disciplines. Statement 9 reads, “I involve individuals outside the project team to regularly review the status of cost, schedule or performance goals.” The mean score for this statement was 3.20.

Figure 20 is a snapshot of how the acquisition community individually ranked the 12 statements in this category. Table 2 and Figure 20 below gives a breakout of the mean score for each question by individual functional disciplines along with the overall mean average for each question.

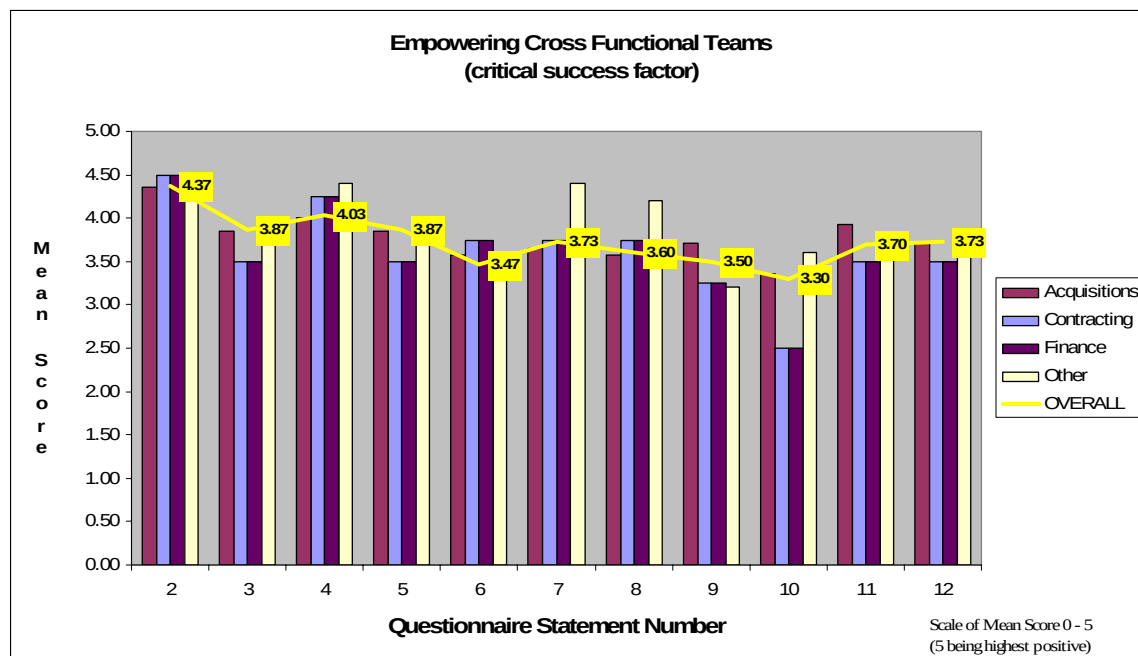


Figure 20. Empowering Cross Functional Teams

CSF 1 - Empowering Cross-Functional Teams									
(highest to lowest mean scores)									
Statement	Acquisitions	Statement	Contracting	Statement	Finance	Statement	Other	Statement	Overall
2	4.36	2	4.50	2	4.50	2	4.40	2	4.37
4	4.00	4	4.25	4	4.25	4	4.40	4	4.03
11	3.93	6	3.75	6	3.75	7	4.40	3	3.87
3	3.86	7	3.75	7	3.75	8	4.20	5	3.87
5	3.86	8	3.75	8	3.75	3	4.00	7	3.73
9	3.71	3	3.50	3	3.50	5	4.00	12	3.73
12	3.71	5	3.50	5	3.50	12	3.80	11	3.70
7	3.64	11	3.50	11	3.50	10	3.60	8	3.60
6	3.57	12	3.50	12	3.50	11	3.60	9	3.50
8	3.57	9	3.25	9	3.25	6	3.40	6	3.47
10	3.36	10	2.50	10	2.50	9	3.20	10	3.30

Table 2. CSF 1 Empowering Cross Functional Teams

2. Managing and Engaging Suppliers

The second critical success factor is Managing and Engaging Suppliers. In this category, the statements with the overall highest mean scores were statement 15 with a mean score of 3.54 and statement 18 with a mean score of 3.61. Statement 15 reads, “My organization uses a rigorous supplier selection process to create a strong supplier base.” Statement 18 reads, “As a core business strategy, my organization embraces effective supplier relationships.” The statements with the lowest overall mean score was statements 16 with a mean score of 3.07 and statement 19 with a mean score of 2.86. Statement 16 reads, “My organization uses strategic purchasing managers for key goods and services.” Statement 19 reads, “My organization provides training to its acquisition workforce on how to manage supplier relationships.” When it comes to suppliers, one feedback write-up that sheds some light on suppliers and contracting was, “In most cases, the Government is well aware of the Primes, but not so aware of the key subcontractors and vendors of key parts -- this has bitten us many times, and we are starting to learn to ask the right questions. Most of the feedback is through award fees and benchmarking -- and through daily contact of Government & contractor IPTs and PMs.”

For the second critical success factor, Managing and Engaging Suppliers, the Acquisitions personnel had the highest mean average for statement 18. It reads, “As a

core business strategy, my organization embraces effective supplier relationships.” The mean score for this statement was 3.83. The lowest mean for this critical success factor by the Acquisitions personnel was statement 16. It reads, “My organization uses strategic purchasing managers for key goods and services.” The mean score for this statement was 3.08.

The Contracting personnel ranked statement 15 highest with a mean score of 3.75. It states, “My organization uses a rigorous supplier selection process to create a strong supplier base.” These personnel ranked statement 19 the lowest with a mean score of 2.00. It states, “My organization provides training to its acquisition workforce on how to manage supplier relationships.” For this critical success factor, the Finance personnel were consistent with the Contracting personnel and gave statements 15 and 19 a mean score of 3.71 and 2.43 respectively.

The “Other” personnel once again agreed with the Acquisition personnel in their assessment of statements 16 and 18. They gave these statements a mean score of 3.80 and 3.20 respectively. This “other personnel” also gave statement 20 and 21 a mean score of 3.20. The statements read: “My organization has established an effective communication and feedback system with its suppliers to continually assess and improve its own and its supplier’s performance.” and “My organization fosters an environment in which its suppliers invest their intellectual capital – their ideas – into the venture” respectfully.

One thing to keep in mind is that this section of Managing and Engaging Suppliers will become more and more important as the defense industry continues to consolidate. As SMC starts dealing with fewer contractors and subcontractors it should establish relationships based on thorough knowledge of the organization and how to incentivize them properly.

Figure 21 is a snapshot of how the acquisition community individually ranked the 12 statements in this category. Table 3 and Figure 21 below gives a breakout of the mean score for each question by individual functional disciplines along with the overall mean average for each question.

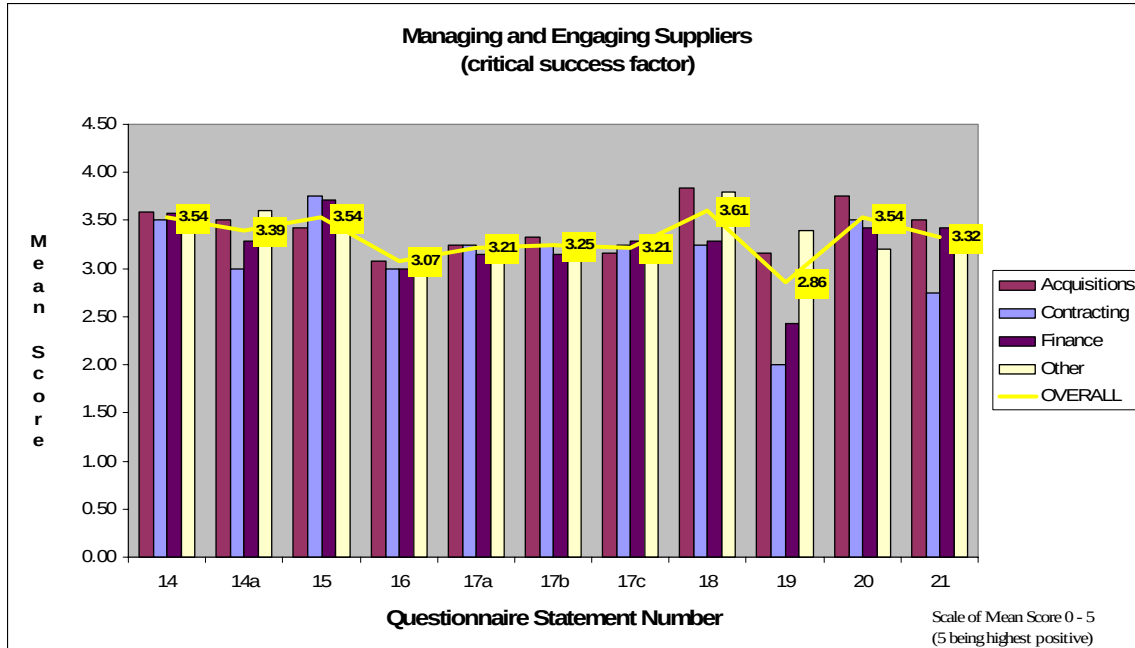


Figure 21. Managing and Engaging Suppliers

CSF 2 - Managing and Engaging Suppliers									
(highest to lowest mean scores)									
Statement	Acquisitions	Statement	Contracting	Statement	Finance	Statement	Other	Statement	Overall
18	3.83	15	3.75	15	3.71	18	3.80	18	3.61
20	3.75	14	3.50	14	3.57	14a	3.60	14	3.54
14	3.58	20	3.50	20	3.43	14	3.40	20	3.54
14a	3.50	17a	3.25	21	3.43	15	3.40	14a	3.39
21	3.50	17b	3.25	14a	3.29	19	3.40	21	3.32
15	3.42	17c	3.25	17c	3.29	16	3.20	17b	3.25
17b	3.33	18	3.25	18	3.29	17a	3.20	17a	3.21
17a	3.25	14a	3.00	17a	3.14	17b	3.20	17c	3.21
17c	3.17	16	3.00	17b	3.14	17c	3.20	15	3.20
19	3.17	21	2.75	16	3.00	20	3.20	16	3.07
16	3.08	19	2.00	19	2.43	21	3.20	19	2.86

Table 3. CSF 2 Managing and Engaging Suppliers

3. Monitoring and Providing Oversight to Achieve Desired Outcomes

Overall, the statements with the highest mean for this critical success factor were statement 24 with a mean score of 3.92 and statement 25 with a mean score of 3.96. Statement 24 reads, “My organization has processes and controls in place to ensure effective oversight of contractor performance.” Statement 25 reads, “My organization

has processes and controls in place to ensure effective oversight of employees making purchases.” The statements with the lowest mean were 32a with a mean score of 2.42 and statement 32b with a mean score of 2.38. Statement 32a reads, “A significant percentage of contracts fail to meet cost.” Statement 32b reads, “A significant percentage of contracts fail to meet schedule.” Furthermore, statement 26 was low with a mean score of 3.15. Statement 26 reads, “My organization rewards our workforce for effectively monitoring contractor performance.” When it comes to a possible explanation to statements 32 a, b, c and d, here is one feedback write-up: “Many current problems are a result of previous faulty acquisition reforms. Getting back on track, but it will not be instant nor without great effort and sound correction of problems.”

The Acquisitions personnel gave statement 25 the highest mean in Monitoring and Providing Oversight to Achieve Desired Outcomes critical success factor. The mean score for this statement was 4.20. For this critical success factor and for the entire questionnaire, everyone agreed their least favorable statements were 32a and 32b. In this case, the Acquisitions personnel gave both statements a mean score of 2.90 and 2.80. The statements were, “A significant percentage of contracts fail to meet cost.” and “A significant percentage of contracts fail to meet schedule.” One other statement that Acquisitions personnel saw less favorably is statement 32, which reads, “My organization monitors effectiveness of policies and processes.” The mean score for this statement was 3.20.

The Contracting personnel gave statement 24 the highest mean in this critical success factor. The statement reads, “My organization has processes and controls in place to ensure effective oversight of contractor performance.” The mean score for this statement was 4.50, which tied with statement two listed previously as the highest mean score they gave to any statement in the entire questionnaire. For the lowest, acquisition personnel gave statement 32 a mean score of 1.50 and statement thirty-two b received a mean score of 1.75. The Contracting personnel were consistent with Acquisitions’ assessment of statement 31 and gave it a mean score of 2.25 but also gave 2.25 to statement 26. It reads, “My organization rewards our workforce for effectively monitoring contractor performance.”

The Finance personnel scored statement 25 comparable to the Acquisitions' assessment of statement 25 with a highly favorable mean score of 3.86 but also gave 3.86 to statement 29. It reads, "My organization uses agency personnel or external parties with appropriate knowledge, skills, and responsibilities to monitor internal control over the acquisition process on a continuous basis." For their least favorable, finance personnel gave statement 31a a mean score of 2.14 and statement 32b received a mean score of 2.00. The Finance personnel agreed with the Contracting assessment of statement 26 and gave it a mean score of 3.00 but also gave 3.00 to statement 30. It reads, "My organization effectively uses and requires its contractors to use earned value management as an investment planning and control tool."

The "Other" functional discipline this time agreed with the Contracting personnel in their assessment of statement 24. They gave it a mean score of 4.20 but also gave 4.20 to statements 27 and 30. Statement 27 reads, "My organization clearly defines the roles and responsibilities for those who perform contract management and oversight." The favorable score to statement 30 is the first time discussed so far where one group, this time Other, has an opposite assessment as another group, in this case Finance. For Other's least favorable, statements 32a and 32b received a mean score of 2.60. The next lowest mean score is 3.20 for both statements thirty-two c and thirty-two d. They read, "A significant percentage of contracts fail to meet performance." and "A significant percentage of contracts fail to meet quality requirements" respectfully.

Figure 22 is a snapshot of how the acquisition community individually ranked the 12 statements in this category. Table 4 and Figure 22 below gives a breakout of the mean score for each question by individual functional disciplines along with the overall mean average for each question.

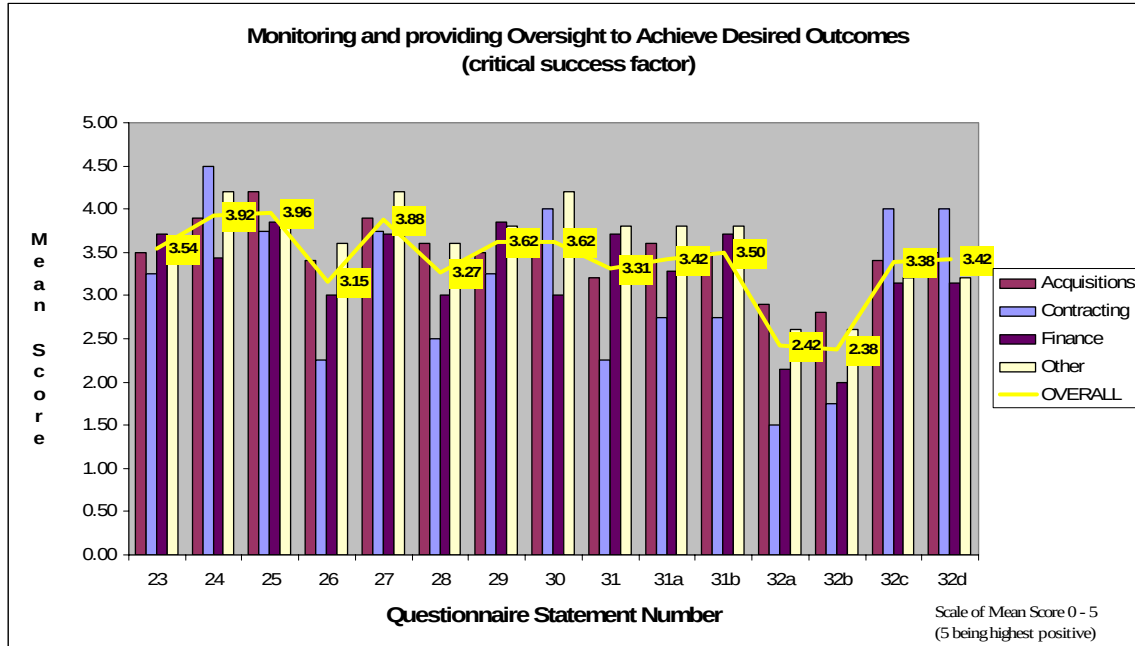


Figure 22. Monitoring and Providing Oversight to Achieve Desired Outcomes

CSF 3 - Monitoring and Providing Oversight to Achieve Desired Outcomes									
(highest to lowest mean scores)									
Statement	Acquisitions	Statement	Contracting	Statement	Finance	Statement	Other	Statement	Overall
25	4.20	24	4.50	25	3.86	24	4.20	25	3.96
24	3.90	30	4.00	29	3.86	27	4.20	24	3.92
27	3.90	32c	4.00	23	3.71	30	4.20	27	3.88
28	3.60	32d	4.00	27	3.71	25	3.80	29	3.62
30	3.60	25	3.75	31	3.71	29	3.80	30	3.62
31a	3.60	27	3.75	31b	3.71	31	3.80	23	3.54
23	3.50	23	3.25	24	3.43	31a	3.80	31b	3.50
29	3.50	29	3.25	31a	3.29	31b	3.80	31a	3.42
31b	3.50	31a	2.75	32c	3.14	23	3.60	32d	3.42
32d	3.50	31b	2.75	32d	3.14	26	3.60	32c	3.38
26	3.40	28	2.50	26	3.00	28	3.60	31	3.31
32c	3.40	26	2.25	28	3.00	32c	3.20	28	3.27
31	3.20	31	2.25	30	3.00	32d	3.20	26	3.15
32a	2.90	32b	1.75	32a	2.14	32a	2.60	32a	2.42
32b	2.80	32a	1.50	32b	2.00	32b	2.60	32b	2.38

Table 4. CSF 3 Monitoring and Providing Oversight to Achieve Desired Outcomes

4. Enabling Financial Accountability

For this final critical success factor of Enabling Financial Accountability, the statement with highest overall positive agreement was statement 37 with a mean score of

4.08. Statement 37 reads, “Financial data resulting from new contracts, task orders and contract modifications is clear and recorded properly.” Following in second was a tie with both statement 34 and 36 having a overall mean score of 4.04. Statement 34 reads, “Our acquisition force has access to and uses timely contractual financial information to monitor and oversee individual acquisitions.” Statement 36 reads, “Our financial management system reports frequently enough to provide reasonable assurance of accountability in acquisitions.” The statement with the lowest agreement was statements 39 with a mean score of 3.08. Statement 39 reads, “My organization has a risk assessment process in place to address improper payments.” Although statement 34 scored well one of the personnel feedback showed some cynicism: “Not clear to me that actual use of data is pervasive and skillful in all projects/programs.”

The Acquisitions functional discipline rated their second highest score for the entire questionnaire to statements 34 and 37. These statements received a mean score of 4.22 and state, “Our acquisition force has access to and uses timely contractual financial information to monitor and oversee individual acquisitions.” and “Financial data resulting from new contracts, task orders and contract modifications is clear and recorded properly” respectfully. The lowest rating by the Acquisitions personnel for this critical success factor is a mean score of 3.44 to statement 39 that reads, “My organization has a risk assessment process in place to address improper payments.”

The Contracting personnel are consistent with the Acquisitions personnel about statement 37 and give it a mean score of 4.25. Their lowest agreement though is with statements 35 and 38 both with a mean score of 2.25. Statement 35 reads, “My organization’s financial management system integrates with the contract management system.” Statement 38 reads, “My organization measures how often erroneous or improper payments are made.”

The Finance personnel are consistent with the Acquisitions personnel scoring their second highest score for the entire questionnaire to statements 34 and 37. However, Finance personnel add statement 36 and give all of them a mean score of 4.14. Statement 36 reads, “Our financial management system reports frequently enough to provide reasonable assurance of accountability in acquisitions.” They also agree with the

Acquisitions functional discipline in their least favorable rating of statement 39, mentioned previously with a mean score of 3.00.

The “Other” personnel gave statement 34, 35, and 36 their highest mean score for this critical success factor with a score of 4.25. Statement 34 was also rated high by Acquisitions, where as, statement 36 was also rated high by Finance. In contrast, statement 35 was rated as a least favorable by Contracting. This is the second direct contrast in the questionnaire results. The Other job group agree with Acquisitions and Finance in placing statement 39 as their least favorable with a mean score of 3.00.

Figure 23 is a snapshot of how the acquisition community individually ranked the 12 statements in this category. Table 5 and Figure 23 below gives a breakout of the mean score for each question by individual functional disciplines along with the overall mean average for each question.

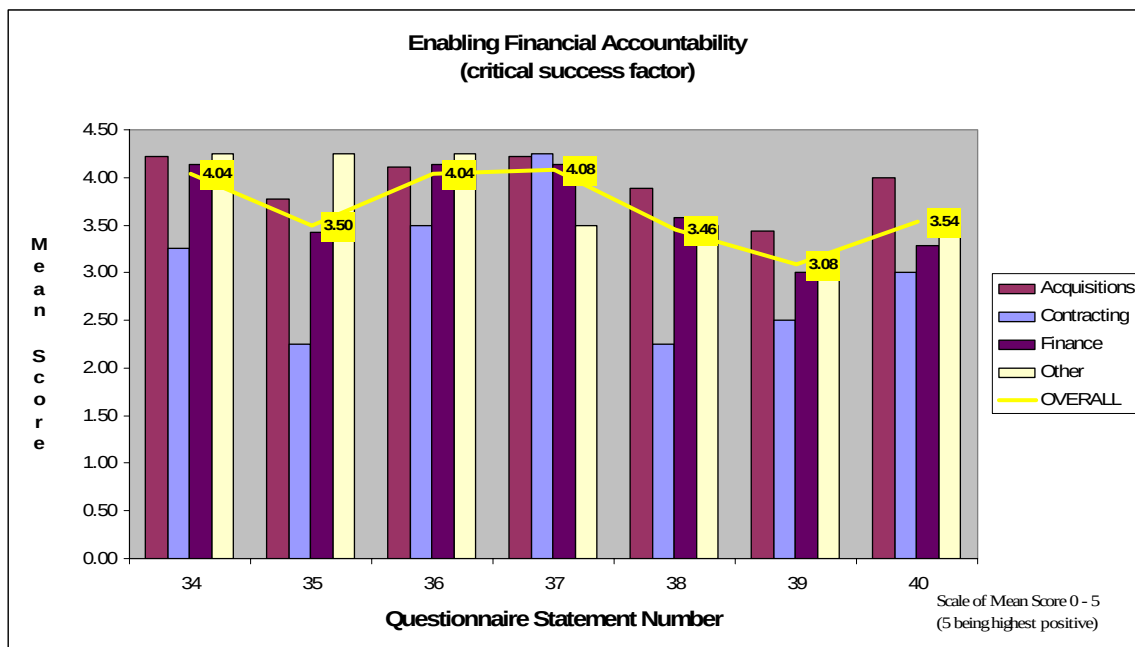


Figure 23. CSF 3 Enabling Financial Accountability

CSF 4 - Enabling Financial Accountability									
(highest to lowest mean scores)									
Statement	Acquisitions	Statement	Contracting	Statement	Finance	Statement	Other	Statement	Overall
34	4.22	37	4.25	34	4.14	34	4.25	37	4.08
37	4.22	36	3.50	36	4.14	35	4.25	34	4.04
36	4.11	34	3.25	37	4.14	36	4.25	36	4.04
40	4.00	40	3.00	38	3.57	37	3.50	40	3.54
38	3.89	39	2.50	35	3.43	38	3.50	35	3.50
35	3.78	35	2.25	40	3.29	40	3.50	38	3.46
39	3.44	38	2.25	39	3.00	39	3.00	39	3.08

Table 5. CSF 4 Enabling Financial Accountability

5. Cumulative Observations

Seen as a whole, there are some observations that can glean a little more insight to SMC's ability to effectively manage the acquisitions policies and processes. Questionnaire statements 2 and 37 are the two highest rated statements. The respondents are confident in their use of cross-functional teams and their clarity and proper recording of new financial data. Questionnaire statements 19, 32a and 32b are the three lowest rated statements as shown in the spreadsheet in appendix 3 "All Statements in Survey." The respondents agree there is little training on how to manage supplier relationships and they understand the reality of their contracts failing to meet cost and schedule.

When comparing the mean of the means for the four critical success factors, Empowering Cross-Functional Teams is the highest with a score of 3.74. This probably reflects the culture that Cross-Functional Teams have been used extensively in SMC. The same analysis shows that Managing and Engaging Suppliers was ranked the lowest factor with a score of 3.32. Perhaps this area can use more emphasis. An analysis throughout job groups shows that the Acquisitions respondents are the most positive with a mean of means score of 3.62 and Contracting respondents are the most negative with a mean of means score of 3.22. Although this observation can be interpreted in many different ways, it at least shows the different perspectives that are brought about by the different functional disciplines within SMC's acquisition community.

Overall, the respondents to this questionnaire were positive about the ability of their organizations to manage effectively and efficiently USAF space acquisitions

process. 93.18 percent of the statements were given a favorable mean score (above 3.00). This leaves less than 7 percent of statements with an overall unfavorable mean score (below 3.00). Although the recommendations that follow will focus on the statements rated unfavorably, there is also room to improve on many statements rated at least somewhat favorably.

D. RECOMMENDATIONS

Very often recommendations focus on the negative findings during a study. To avoid a purely negative section we will commence with the particular actions that respondents highlighted as strengths in the questionnaire. The following items received a cumulative mean score of over 4.0, with the highest mean score allowable being 5.0.

Statement 2 and 4 are a big key to effective acquisitions. The respondents strongly agree that their organizations use cross-functional teams and that they feel empowered to make decisions that affect the projects outcome. The initial recommendation is to continue to focus on these cross-functional teams. Use them efficiently and effectively by bringing the correct mix of stakeholders to SMC who will provide pertinent knowledge and program status, and continue to give the team leaders the proper authority to make the decisions required to move the program in the right direction. The GAO assessment framework sees this combination of virtues as keys for project implementation.

Statement 34, 36, and 37 are all part of the Enabling Financial Accountability Critical Success Factor. By scoring these three statements high, the respondents give us great insight to the importance they place on financial information. The second recommendation is to continue to use and perfect timely and accurate contractual financial information. The GAO assessment framework states that concentrating on this information is indicative for good acquisitions outcomes.

The recommendations for improvement stem from some of the lowest cumulative mean scored statements in the questionnaire. These statements were rated from 2.86 to

3.30. Although statements with a score over 3.0 show a degree of positive agreement, they are still included here since they were comparatively low and therefore have been noted for improvement.

The most important recommendation in this research paper is to provide more and/or better training on how to manage supplier relationships throughout the acquisitions workforce. The lowest scoring statement fell into for the Managing and Engaging Suppliers current success factor section; therefore, this area is identified as an area as needing attention. The GAO assessment framework sites concern with an acquisitions workforce that lacks the skills, knowledge, and expertise to manage supplier relationships effectively. This report does not infer that the workforce indeed lacks skills, knowledge, and expertise, but the recommendation is in place to ensure that the workforce receives training that enhances their current abilities.

Statement 10 was the lowest scoring of the Empowering Cross-Functional Teams section. This statement shows there may not be enough of an incentive structure in place to encourage meeting project goals. One of the cautions that the GAO assessment framework indicates may hinder good acquisition outcomes states: “Teams fail to use key elements of good project management techniques, including monitoring project performance and establishing controls and incentives to meet project goals.” A key part of this caution is establishing incentives. Project goals may be met in the short term by simply monitoring and controlling, but it is our recommendation that for the long term, creative incentives should be part of the organizations project management strategy.

Statement 26 from Monitoring and Providing Oversight to Achieve Desired Outcomes section shows a similar problem to the above recommendation. In this case, instead of incentives, the questionnaire is talking about setting up rewards. Respondents were not sure about rewards to the workforce for effectively monitoring contractor performance. The recommendation in this case is to set up creative rewards to better incentivize the workforce in this vital aspect of acquisitions management.

The lowest mean score for the critical success factor, Enabling Financial Accountability, was the lowest scoring statement was number 35. The respondents are

least favorable about their organization having a risk management process in place to address improper payments. A caution by the GAO assessment framework states that inadequate transaction processing, particularly improper payment, occurring frequently hinder good acquisition outcomes. Therefore, our final recommendation is that more emphasis be place on a risk assessment process for financial data, especially in the areas of identification and mitigation of improper payments.

E. SUMMARY

This chapter presented the findings from the questionnaire given to SMC personnel. By analyzing the questionnaire results using the four current success factors under the “Effectively managing the acquisition process” element of the GAO assessment framework. We have highlighted strengths and weaknesses in SMC’s ability to effectively and efficiently manage the acquisitions policies and processes within the USAF space acquisition community. This chapter then took this information and compared it to the “look for” and “cautions” of the GAO assessment framework to indicate practices and activities that either facilitate or hinder good acquisitions outcomes. The recommendations suggested are a direct reflection of these practices and activities that the GAO assessment framework looks for in the acquisition function of federal agencies.

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V. SUMMARY, RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

A. SUMMARY

The purpose of this report was to analyze the current structure of USAF space acquisitions. More specifically this research looked at AFSPC's current policies and processes, based on the FY02 acquisition realignment, of SMC from AFMC to AFSPC to determine if they are operating efficiently and effectively. This report provides analysis based on literary review and questionnaires gathered from personnel in the USAF space acquisition community. This research concentrated on the efficient and effective policies and procedures of space acquisitions in relation to the functional disciplines of acquisition, contracting and program control (budget).

To analyze Space Acquisitions, GAO's "Framework for Assessing the Acquisition Function at Federal Agencies" was utilized. The GAO assessment framework provides four cornerstones to analyze acquisition communities. However, due to limitations this report was narrowed down to an analysis of A.F. Space Acquisitions using the cornerstone of "Policies and Practices." It was then further tapered down in order to concentrate on the element "Effectively Managing the Acquisition Process."

From the element, "Effectively Managing the Acquisition Process" the GAO assessment framework provided four critical success factors; (1) Empowering Cross Function Teams, (2) Managing and Engaging Suppliers, (3) Monitoring and Providing Oversight to Achieve Desired Outcomes and (4) Enabling Financial Accountability. These critical success factors were used to construct a survey for SMC personnel. The surveys provided management and leadership insight from personnel with hands-on knowledge of space acquisitions.

As a recap, questionnaire statements 2 and 37 are the two highest rated statements. The respondents are confident in their use of cross-functional teams and their clarity and proper recording of new financial data. Questionnaire statements 19, 32a and

32b are the three lowest rated statements. The respondents agree there is little training on how to manage supplier relationships and they understand the reality of their contracts failing to meet cost and schedule.

B. RECOMMENDATIONS

Distributing the questionnaire generated in this research paper to AFMC acquisition personnel would provide them with an assessment tool to analyze how effective and efficient their current acquisition policies and procedures are. It can provide management and command leadership with insight into what levels their acquisition community is operating, in reference to maintaining efficient and effective policies and procedures in place in relations to their acquisition missions. Furthermore, the survey could be utilized in other USAF commands or bases that have acquisition communities.

AFSPC should share with other commands best practices noted in this report. Furthermore, they can retrieve information from AFMC on areas that need attention. This information can help AFSPC correct areas of weakness or determine if it is an USAF wide deficiency. If it is determined to be an USAF wide deficiency then a cross-command tiger team can be implemented for corrective actions.

C. FURTHER RESEARCH AREAS

Valuable insight came from this project and yet, as mentioned earlier, it was limited in scope. Research based off the other two elements under the GAO assessment framework cornerstone “Policies and Procedures” would give AFSPC a stronger analysis of their space acquisition policies and procedures. Also, research based off the other three GAO assessment framework cornerstones would provide AFSPC with a more in-depth analysis of their space acquisition functions. In addition, DoD could gain further insight into its acquisition communities by utilizing this same GAO assessment framework to analyze other organizations like AFMC, NAVAIR, NAVSEA, etc. Figure 24 provides all of the cornerstones, elements and critical success factors provided by the GAO framework for assessing acquisition functions in federal agencies.

Cornerstones	Elements	Critical Success Factors
Organizational Alignment and Leadership	Aligning Acquisition with Agency's Missions and Needs	• Assuring Appropriate Placement of the Acquisition Function • Organizing the Acquisition Function to Operate Strategically • Clearly Defining and Integrating Roles and Responsibilities
	Commitment from Leadership	• Clear, Strong, and Ethical Executive Leadership • Effective Communications and Continuous Improvement
Policies and Processes	Planning Strategically	• Partnering with Internal Organizations • Assessing Internal Requirements and the Impact of External Events
	Effectively Managing the Acquisition Process	• Empowering Cross-Functional Teams • Managing and Engaging Suppliers • Monitoring and Providing Oversight to Achieve Desired Outcomes • Enabling Financial Accountability
	Promoting Successful Outcomes of Major Projects	• Using Sound Capital Investment Strategies • Employing Knowledge-Based Acquisition Approaches
Human Capital	Valuing and Investing in the Acquisition Workforce	• Commitment to Human Capital Management • Role of the Human Capital Function
	Strategic Human Capital Planning	• Integration and Alignment • Data-Driven Human Capital Decisions
	Acquiring, Developing, and Retaining Talent	• Targeted Investments in People • Human Capital Approaches Tailored to Meet Organizational Needs
	Creating Results-Oriented Organizational Cultures	• Empowerment and Inclusiveness • Unit and Individual Performance Linked to Organizational Goals
Knowledge and Information Management	Identifying Data and Technology that Support Acquisition Management Decisions	• Tracking Acquisition Data • Translating Financial Data into Meaningful Formats • Analyzing Goods and Services Spending
	Safeguarding the Integrity of Operations and Data	• Ensuring Effective General and Application Controls • Data Stewardship

Figure 24. Framework for Assessing the Acquisition Function (From: Government Accountability Office. "Framework for Assessing the Acquisition Function at Federal Agencies." GAO-05-218G. Washington, D.C., September 2005.)

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APPENDIX

A. QUESTIONNAIRE

1. INTRODUCTION:

Greetings from the Naval Postgraduate School. This questionnaire should take approximately 10 minutes. It has 37 questions and 4 blocks for comments. For a thesis project, please help us better analyze the current structure of the acquisitions arm of Air Force Space Command. This questionnaire is for SMC acquisitions, contracting and finance personnel. The questionnaire is anonymous and follows the regulations set by the Naval Postgraduate School's Human Subjects Committee.

Click "Next" to start the survey. If you need to leave the survey at any time, just click "Exit this survey". Your answers will be saved.

1. Is your job at SMC more closely associated with:

- Acquisitions
- Contracting
- Finance
- Other (please specify)

2. EMPOWERING CROSS FUNCTIONAL TEAMS:

Note: All these questions are based on what you have seen within your organization since the SMC realignment into AFSPC.

At the end of every section there is a comments block where you can provide extra feedback on any questions which require any explanation or clarification.

Scale				
1: Definitely Disagree	2: Disagree	3: Neither agree nor disagree	4: Agree	5: Definitely Agree

2. Our organization uses cross-functional teams in performing acquisitions activities.
3. We involve staff from field offices in acquisitions decisions.
4. I feel empowered to make decisions that affect the projects outcome.
5. I use a project plan to manage and control implementation of projects.
6. My project's plan uses performance measurement baselines for schedule and cost.
7. My project's plan uses performance measurement baselines for major milestones and target dates.

8. My project's plan uses performance measurement baselines for risk associated with the project.
9. I involve individuals outside the project team to regularly review the status of cost, schedule or performance goals.
10. There are incentives in place to encourage my team to meet project goals.
11. Our teams are held accountable for meeting cost, schedule and performance goals.
12. There is open, honest and clear communication among all stakeholders (team members, program officials, contractors)
13. Please provide extra feedback here for any of the questions from this section. State the question number and provide any explanation or clarification.

3. MANAGING AND ENGAGING SUPPLIERS

14. My organization has a process to identify key suppliers.
 - a. My organization shares key supplier knowledge across the organization.
15. My organization uses a rigorous supplier selection process to create a strong supplier base.
16. My organization uses strategic purchasing managers for key goods and services.
17. The strategic purchasing managers in our organization are actively involved in:
 - a. Defining requirements with internal clients
 - b. Negotiating with potential providers of goods and services
 - c. Assisting and resolving performance or other issues after the contract is awarded
18. As a core business strategy, my organization embraces effective supplier relationships.
19. My organization provides training to its acquisition workforce on how to manage supplier relationships.
20. My organization has established an effective communication and feedback system with its suppliers to continually assess and improve its own and its supplier's performance.
21. My organization fosters an environment in which its suppliers invest their intellectual capital – their ideas – into the venture.
22. Please provide extra feedback here for any of the questions from this section. State the question number and provide any explanation or clarification.

4. MONITORING AND PROVIDING OVERSIGHT TO ACHIEVE DESIRED OUTCOMES

23. My organization tracks the types of acquisition methods used for acquiring goods and services to assess workload and training requirements.
24. My organization has processes and controls in place to ensure effective oversight of contractor performance.
25. My organization has processes and controls in place to ensure effective oversight of employees making purchases.

26. My organization rewards our workforce for effectively monitoring contractor performance.
27. My organization clearly defines the roles and responsibilities for those who perform contract management and oversight.
28. My organization has taken required actions to ensure that it has adequate staff with the right skills, knowledge, and training to implement policies and processes and to oversee contractors.
29. My organization uses agency personnel or external parties with appropriate knowledge, skills, and responsibilities to monitor internal control over the acquisition process on a continuous basis.
30. My organization effectively uses and requires its contractors to use earned value management as an investment planning and control tool.
31. My organization monitors effectiveness of policies and processes:
- a. My organization completes a cost benefit analysis when considering alternative policies and processes
 - b. My organization follows its own findings identified in the monitoring efforts
32. A significant percentage of contracts fail to meet:
- a. Cost
 - b. Schedule
 - c. Performance
 - d. Quality requirements
33. Please provide extra feedback here for any of the questions from this section. State the question number and provide any explanation or clarification.

5. ENABLING FINANCIAL ACCOUNTABILITY

34. Our acquisition force has access to and uses timely contractual financial information to monitor and oversee individual acquisitions.
35. My organization's financial management system integrates with the contract management system.
36. Our financial management system reports frequently enough to provide reasonable assurance of accountability in acquisitions.
37. Financial data resulting from new contracts, task orders and contract modifications is clear and recorded properly.
38. My organization measures how often erroneous or improper payments are made.
39. My organization has a risk assessment process in place to address improper payments.
40. My organization takes appropriate corrective action when the contractor is not meeting expectations for cost, schedule or performance.
41. Please provide extra feedback here for any of the questions from this section. State the question number and provide any explanation or clarification

B. QUESTIONNAIRE RESULTS

Empowering Cross-Functional Teams												
Question Number:	2	3	4	5	6	7	8	9	10	11	12	
	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Mean
Acquisitions	5	4	4	5	4	4	4	4	2	2	2	3.64
	4	4	5	4	4	4	3	5	4	5	4	4.18
	4	4	3	4	3	3	3	4	4	4	4	3.64
	5	4	5	3	3	3	3	3	5	5	3	3.82
	4	3	3	4	4	4	4	4	3	4	3	3.64
	4	4	4	3	4	4	4	3	3	3	4	3.64
	4	4	4	4	3	4	4	3	2	4	4	3.64
	5	5	5	3	3	3	3	4	3	4	5	3.91
	4	3	4	4	2	2	4	2	2	2	3	2.91
	4	3	5	5	4	4	4	4	3	4	3	3.91
	5	4	4	4	4	4	4	3	4	4	4	4.00
	4	3	2	3	4	4	3	4	4	4	3	3.45
	5	5	4	4	3	3	3	4	4	5	5	4.09
	4	4	4	4	5	5	4	5	4	5	5	4.45
Mean	4.36	3.86	4.00	3.86	3.57	3.64	3.57	3.71	3.36	3.93	3.71	3.78
												Mean
Contracting	5	4	4	2	4	4	4	3	3	3	4	3.64
	5	2	5	5	5	5	5	5	1	4	2	4.00
	4	4	4	4	3	3	3	2	1	4	4	3.27
	4	4	4	3	3	3	3	3	5	3	4	3.55
Mean	4.50	3.50	4.25	3.50	3.75	3.75	3.75	3.25	2.50	3.50	3.50	3.61
												Mean
Finance	4	3	1	4	1	1	1	1	1	1	1	1.73
	4	4	4	4	4	4	4	3	3	3	5	3.82
	5	5	5	5	3	3	3	5	4	5	5	4.36
	4	4	4	4	4	5	4	3	4	3	5	4.00
	4	3	4	3	3	3	3	3	3	3	3	3.18
	5	5	4	4	3	4	3	5	4	5	4	4.18
	4	4	4	4	4	4	4	4	5	4	4	4.09
Mean	4.29	4.00	3.71	4.00	3.14	3.43	3.14	3.43	3.43	3.43	3.86	3.62
												Mean
Other:												
Systems Eng	4	4	4	4	3	4	4	4	3	2	2	3.45
Engineering	5	5	5	4	1	5	5	2	4	4	4	4.00
Sustainment	4	3	4	4	4	4	4	2	3	4	4	3.64
Cost Analysis	5	4	5	4	5	5	4	4	4	4	5	4.45
Administrative	4	4	4	4	4	4	4	4	4	4	4	4.00
Mean	4.40	4.00	4.40	4.00	3.40	4.40	4.20	3.20	3.60	3.60	3.80	3.91
Cumulative Mean	4.37	3.87	4.03	3.87	3.47	3.73	3.60	3.50	3.30	3.70	3.73	3.74

Managing and Engaging Suppliers												
Question Number:	14	14a	15	16	17a	17b	17c	18	19	20	21	
	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Mean
Acquisitions	4	3	2	2	3	3	3	4	2	4	2	2.91
	4	4	3	4	3	3	3	4	3	4	4	3.55
	4	4	4	4	4	4	4	4	4	4	4	4.00
	4	4	3	4	3	4	2	4	2	4	4	3.45
	2	2	4	3	3	3	3	4	3	3	3	3.00
	4	4	5	3	3	3	3	4	4	3	3	3.55
	4	4	4	3	4	4	4	4	3	4	4	3.82
	4	4	2	2	3	3	3	3	2	4	3	3.00
	4	4	3	3	3	3	3	4	4	4	4	3.55
	3	3	3	3	3	3	3	3	3	3	3	3.00
	2	2	4	2	3	3	3	4	4	4	4	3.18
	4	4	4	4	4	4	4	4	4	4	4	4.00
Mean	3.58	3.50	3.42	3.08	3.25	3.33	3.17	3.83	3.17	3.75	3.50	3.42
												Mean
Contracting	2	2	4	2	2	2	2	2	1	2	3	2.18
	5	4	5	5	5	5	5	4	1	4	1	4.00
	3	3	3	2	3	3	3	4	2	4	4	3.09
	4	3	3	3	3	3	3	3	4	4	3	3.27
Mean	3.50	3.00	3.75	3.00	3.25	3.25	3.25	3.25	2.00	3.50	2.75	3.14
												Mean
Finance	4	4	4	1	3	3	3	2	1	1	4	2.73
	4	3	4	4	3	2	3	4	2	4	2	3.18
	3	3	3	3	3	3	3	3	3	3	3	3.00
	4	4	5	3	3	3	3	3	2	4	5	3.55
	3	3	3	3	3	3	3	3	3	3	3	3.00
	3	3	3	4	4	5	5	5	3	4	3	3.82
	4	3	4	3	3	3	3	3	3	5	4	3.45
Mean	3.57	3.29	3.71	3.00	3.14	3.14	3.29	3.29	2.43	3.43	3.43	3.25
Other:												Mean
Systems Eng	4	4	4	4	4	4	4	4	3	3	3	3.73
Engineering	3	4	3	2	2	2	2	3	3	3	3	2.73
Sustainment	3	3	3	3	3	3	3	3	4	3	3	3.09
Cost Analysis	3	3	3	3	3	3	3	5	3	3	3	3.18
Administrative	4	4	4	4	4	4	4	4	4	4	4	4.00
Mean	3.40	3.60	3.40	3.20	3.20	3.20	3.20	3.80	3.40	3.20	3.20	3.35
Cumulative Mean:	3.54	3.39	3.54	3.07	3.21	3.25	3.21	3.61	2.86	3.54	3.32	3.32

Monitoring and Providing Oversight to Achieve Desired Outcomes																	
Question Number:	23	24	25	26	27	28	29	30	31	31a	31b	*	*	*	*		
	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:		
Acquisitions	3	4	4	3	2	3	3	3	2	3	3	2	2	2	2	2	Mean
	2	5	4	4	5	5	5	4	4	5	4	5	4	5	4	4	2.73
																	4.33
	5	5	5	5	5	5	5	5	5	4	4	2	2	4	4		4.33
	4	2	5	3	4	4	3	3	3	4	4	4	4	3	4		3.60
	4	3	4	2	3	4	4	3	3	3	4	3	2	2	4	4	3.27
	3	4	4	3	4	2	3	4	4	3	4	3	3	3	4	4	3.47
	3	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	3.80
	4	4	4	3	4	2	2	2	2	3	3	1	1	2	3		2.67
	4	4	4	4	4	4	3	4	3	3	3	4	4	4	4		3.73
	3	4	4	3	4	3	4	4	3	3	3	2	2	2	2		3.07
Mean	3.50	3.90	4.20	3.40	3.90	3.60	3.50	3.60	3.20	3.60	3.50	2.90	2.80	3.40	3.50		3.50
																	Mean
Contracting	1	4	4	2	2	1	4	2	2	2	2	2	2	4	4		2.53
	5	5	2	1	5	1	2	5	1	2	2	1	1	4	4		2.73
	2	4	4	3	4	4	3	5	2	3	3	1	2	4	4		3.20
	5	5	5	3	4	4	4	4	4	4	4	2	2	4	4		3.87
Mean	3.25	4.50	3.75	2.25	3.75	2.50	3.25	4.00	2.25	2.75	2.75	1.50	1.75	4.00	4.00		3.08
																	Mean
Finance	2	1	1	1	2	2	5	1	1	1	3	2	2	2	2		1.87
	4	4	4	2	4	2	2	4	4	4	4	2	2	4	4		3.33
	5	3	4	3	3	3	5	3	5	5	5	2	2	5	5		3.87
	3	3	5	4	5	3	4	2	4	3	3	1	1	2	2		3.00
	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3		3.07
	4	5	5	4	5	4	4	4	5	4	4	4	3	3	3		4.07
	5	5	4	4	4	4	4	4	4	3	4	1	1	3	3		3.53
Mean	3.71	3.43	3.86	3.00	3.71	3.00	3.86	3.00	3.71	3.29	3.71	2.14	2.00	3.14	3.14		3.25
																	Mean
Other:																	
Systems Eng	4	3	4	2	4	3	4	4	4	4	4	2	2	4	4		3.47
Engineering	4	4	4	4	4	5	5	4	4	4	4	3	3	3	3		3.87
Sustainment	3	5	4	4	4	4	3	4	3	3	3	4	4	4	4		3.73
Cost Analysis	3	5	3	4	5	2	3	5	4	4	4	2	2	3	3		3.47
Administrative	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2		3.47
Mean	3.60	4.20	3.80	3.60	4.20	3.60	3.80	4.20	3.80	3.80	3.80	2.60	2.60	3.20	3.20		3.60
Cumulative Mean:	3.54	3.92	3.96	3.15	3.88	3.27	3.62	3.62	3.31	3.42	3.50	2.42	2.38	3.38	3.42		3.39

* Indicates columns where responses were normalized to reflect proper scoring procedures

Enabling Financial Accountability

Question Number:	34	35	36	37	38	39	40		Cumulative		
	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Answer:	Mean	Mean	Count	Mean x Count
Acquisitions	4	2	4	4	4	4	4	3.71	3.16	44.00	139
	5	5	4	4	5	3	5	4.43	4.11	44.00	181
									3.64	11.00	40
	4	4	4	4	4	4	4	4.00	4.07	44.00	179
	4	3	4	4	2	2	4	3.29	3.52	44.00	155
									3.30	37.00	122
	4	4	3	4	3	3	4	3.57	3.55	44.00	156
	5	5	5	5	5	5	5	5.00	4.02	44.00	177
									2.91	11.00	32
	4	4	4	4	4	3	2	3.57	3.20	44.00	141
	4	4	5	5	5	4	5	4.57	3.89	44.00	171
	4	3	4	4	3	3	3	3.43	3.20	44.00	141
									3.64	22.00	80
									4.23	22.00	93
Mean	4.22	3.78	4.11	4.22	3.89	3.44	4.00	3.95	3.6212	499.00	1807.00
Contracting	2	2	2	4	1	2	4	2.43	2.70	44.00	119
	4	4	5	5	2	2	2	3.43	3.48	44.00	153
	3	1	3	4	3	3	2	2.71	3.11	44.00	137
	4	2	4	4	3	3	4	3.43	3.57	44.00	157
Mean	3.25	2.25	3.50	4.25	2.25	2.50	3.00	3.00	3.22	176.00	566.00
Finance	5	5	5	5	5	5	1	4.43	2.45	44.00	
	4	3	4	5	4	2	4	3.71	3.48	44.00	
	5	3	5	4	4	2	3	3.71	3.75	44.00	
	3	2	3	3	2	2	2	2.43	3.30	44.00	
	3	3	4	4	3	3	3	3.29	3.11	44.00	
	5	4	4	4	3	3	5	4.00	4.02	44.00	
	4	4	4	4	4	4	5	4.14	3.75	44.00	
Mean	4.14	3.43	4.14	4.14	3.57	3.00	3.29	3.67	3.41	308.00	
Other:								Mean	Mean	Count	
Systems Eng	4	4	4	2	3	2	2	3.00	3.45	44.00	152
Engineering	4	4	4	4	4	3	3	3.71	3.59	44.00	158
Sustainment									3.51	37.00	130
Cost Analysis	5	5	5	4	3	3	5	4.29	3.77	44.00	166
Administrative	4	4	4	4	4	4	4	4.00	3.82	44.00	168
Mean	4.25	4.25	4.25	3.50	3.50	3.00	3.50	3.75	3.63	213.00	774.00
Cumulative Mean:	4.04	3.50	4.04	4.08	3.46	3.08	3.54	3.68			

C. ALL STATEMENTS IN SURVEY

All Statements in Survey									
(highest to lowest mean scores)									
Statement	Acquisitions	Statement	Contracting	Statement	Finance	Statement	Other	Statement	Overall
2	436	2	450	2	450	2	440	2	437
34	422	24	450	4	425	4	440	32a	408
37	422	4	425	31	414	7	440	31	404
25	420	32a	425	31b	414	31	425	31b	404
36	411	30	400	32a	414	31a	425	4	403
4	400	32c	400	25	386	31b	425	25	396
40	400	32d	400	29	386	8	420	24	392
11	393	6	375	6	375	24	420	27	388
24	390	7	375	7	375	27	420	3	387
27	390	8	375	8	375	30	420	5	387
38	389	15	375	15	371	3	400	7	373
3	386	25	375	23	371	5	400	12	373
5	386	27	375	27	371	12	380	11	370
18	383	3	350	31	371	18	380	29	362
35	378	5	350	31b	371	25	380	30	362
20	375	11	350	14	357	29	380	18	361
9	371	12	350	32b	357	31	380	8	360
12	371	14	350	3	350	31a	380	14	354
7	364	20	350	5	350	31b	380	20	354
28	360	31b	350	11	350	10	360	23	354
30	360	9	325	12	350	11	360	32d	354
31a	360	17a	325	20	343	14a	360	9	350
14	358	17b	325	21	343	23	360	31b	350
6	357	17c	325	24	343	26	360	31a	350
8	357	18	325	31a	343	28	360	6	347
14a	350	23	325	14a	329	32a	350	32b	346
21	350	29	325	17c	329	32b	350	31a	342
23	350	31	325	18	329	32d	350	32d	342
29	350	14a	300	31a	329	6	340	14a	339
31b	350	16	300	32d	329	14	340	32c	338
32d	350	32d	300	9	325	15	340	21	332
39	344	21	275	17a	314	19	340	31	331
15	342	31a	275	17b	314	9	320	10	330
26	340	31b	275	32c	314	16	320	28	327
32c	340	10	250	32d	314	17a	320	17b	325
10	336	28	250	16	300	17b	320	17a	321
17b	333	32c	250	26	300	17c	320	17c	321
17a	325	26	225	28	300	20	320	15	320
31	320	31	225	30	300	21	320	26	315
17c	317	31a	225	32c	300	32c	320	32c	308
19	317	32b	225	10	250	32d	320	16	307
16	308	19	200	19	243	32c	300	19	286
32a	290	32b	175	32a	214	32a	260	32a	242
32b	280	32a	150	32b	200	32b	260	32b	238

D. GAO ASSESSMENT FRAMEWORK INDICATORS FOR "EFFECTIVELY MANAGING THE ACQUISITION PROCESS"

Element – “Effectively Managing the Acquisition Process”

I. Critical Success Factor – “Empowering Cross-Functional Teams”

KEY QUESTIONS

- To what extent does the agency use cross-functional teams in performing acquisition activities? Are staff from field offices involved at any level? How?
- Do team members feel empowered to make decisions and are they invested in the project’s outcome?
- Do the teams use a project plan to manage and control project implementation?
- Does the project plan include performance measurement baselines for schedule and cost, major milestones, and target dates and risks associated with the project?
- Do individuals outside the project team regularly review the status of cost, schedule, and performance goals?
- Are incentives in place to encourage teams to meet project goals?
- How are teams held accountable for meeting cost, schedule, and performance goals?
- Is there good communication among all stakeholders?

LOOK FOR

- The agency uses cross-functional teams to plan for and manage projects. These teams develop a project plan to implement projects effectively.
- The agency systematically monitors project performance and establishes controls and incentives for accountability.
- Open, honest, and clear communication is encouraged among all parties, including team members, program officials, and contractors.

CAUTIONS

- The agency makes limited use of cross-functional teams.
- Project team members do not feel empowered to make decisions or invested in the project outcome.
- Teams fail to use key elements of good project management techniques, including monitoring project performance and establishing controls and incentives to meet project goals.

II. Critical Success Factor – “Managing and Engaging Suppliers”

KEY QUESTIONS

- Does the agency have a process to identify key suppliers?
- Does the agency use a rigorous supplier selection process to create a strong supplier base?
- Has the agency established commodity managers for key goods and services?

- What is the role of the commodity manager?
- Has the agency embraced effective supplier relationships as a core business strategy?
- Does the agency train its acquisition workforce on how to manage supplier relationships?
- Has the agency established an effective communication and feedback system with its suppliers to continually assess and improve its own and its suppliers' performance?
- Does the agency foster an environment in which suppliers invest their intellectual capital—their ideas—into the venture?

LOOK FOR

- The agency uses stringent supplier selection criteria while maintaining an appropriate level of competition among suppliers.
- The agency has established commodity managers for key goods and services.
- Commodity managers are actively involved in defining requirements with internal clients, negotiating with potential providers of goods and services, and assisting in resolving performance or other issues after the contract is awarded.
- The agency has established an effective communication and feedback system with its suppliers, such as designating an authoritative person as a single interface with key suppliers; using integrated teams to facilitate sharing of information; establishing an objective basis for providing feedback by setting performance measures and expectations in terms of quality, responsiveness, timeliness, and cost; providing periodic “report cards” and meeting formally with key suppliers to discuss issues; and using surveys, supplier meetings, and formal agency-supplier councils or supplier advisory councils to assess existing customer-supplier working arrangements, identify problem areas, and report back to suppliers.

CAUTIONS

- Knowledge of its key suppliers is not shared across the agency.
- The agency does not take full advantage of the suppliers' intellectual capital, such as design or product ideas.
- The agency makes limited or no use of commodity managers to manage the acquisition of key goods and services.
- Commodity managers lack expertise, knowledge, or adequate training in the goods and services being procured.
- The agency is dependent on one or two suppliers for key goods or services.
- The agency continues to select the same suppliers without periodically assessing whether the goods and services offered are competitive in terms of price, quality, and performance.
- The acquisition workforce lacks the skills, knowledge, and expertise to manage supplier relationships effectively.

III. Critical Success Factor – “Monitoring and Providing Oversight to Achieve Desired Outcomes”

KEY QUESTIONS

- Does the agency track the types of acquisition methods used for acquiring goods and services to assess workload and training requirements?
- What tools, processes, and controls does the agency use to ensure effective oversight of contractor performance?
- What tools, processes, and controls does the agency use to ensure effective oversight of employees making purchases?
- What incentives does the acquisition workforce have to effectively monitor contractor performance?
- Does the agency clearly define the roles and responsibilities for those who perform contract management and oversight?
- What actions has the agency taken to ensure that it has adequate staff with the right skills, knowledge, and training to implement policies and processes and to oversee contractors?
- Do agency personnel or external parties with appropriate knowledge, skills, and responsibilities monitor internal control over the acquisition process on a continuous basis?
- Does the agency effectively use and require its contractors to use earned value management as an investment planning and control tool?

LOOK FOR

- The agency has undertaken a workforce-planning effort to ensure that individuals who award, manage, and monitor contracts have clearly defined roles and responsibilities and have the appropriate workload, skills, and training to perform their jobs effectively.
- The agency employs contract monitoring plans or risk-based strategies, and tracks contractor performance.
- The agency regularly reviews contract oversight processes, identifies areas needing improvement, and establishes and implements corrective action plans.
- The agency monitors the effectiveness of policies and processes, completes a cost benefit analysis when considering alternative policies and processes, and follows up on findings identified in monitoring efforts.
- The agency’s suppliers have established earned value management systems, and the agency verifies that it and its suppliers effectively implement earned value management processes and procedures on all applicable programs.

CAUTIONS

- Personnel responsible for contract management have skills and knowledge gaps that inhibit their ability to properly oversee the types of contracts used by the agency.
- The agency does not monitor whether its contracts meet cost, schedule, performance, and quality requirements.

- A significant percentage of contracts fail to meet cost, schedule, performance, and quality requirements.
- The agency does not assign clear roles and responsibilities for overseeing contracts.
- There are material weaknesses and/or reportable conditions related to acquisitions in the agency's performance and accountability report.
- Earned value data are unavailable or unreliable, and earned value management principles are not properly implemented.

IV. Critical Success Factor – “Enabling Financial Accountability”

KEY QUESTIONS

- Does the acquisition workforce have access to and use timely contractual financial information to monitor and oversee individual acquisitions?
- Is the agency's financial management system integrated with its contract management system?
- Does the financial management system report frequently enough to provide reasonable assurance of accountability in acquisitions?
- Are financial data resulting from new contracts, task orders, and contract modifications clear and recorded properly?
- Does the agency measure how often erroneous or improper payments are made? Is a risk assessment process in place to address improper payments?

LOOK FOR

- The acquisition workforce has ready access to information on obligated and expended funds, with sufficient information to assure proper oversight and accounting at the contract level.
- Entries are made to the financial management system that update the contract management and property accountability systems.
- The agency reports frequently enough—monthly or quarterly—to ensure accountability in the acquisition function.
- Adjustments to contract accounting records are clearly reported and accurate; such adjustments represent a low percentage of financial transactions.
- Erroneous and improper payments and cost overruns are tracked and are not a significant problem.
- The agency takes appropriate corrective action when the contractor is not meeting expectations for cost, schedule, or performance.

CAUTIONS

- Acquisition and financial management staff lacks access to critical information, including fiscal year; appropriation/Treasury fund symbol; organization code; cost center; object classification; estimated amount; project code; program code; transaction date; action code; subject-to-funds-availability indicator; asset identifier code; contractor code/name; trading partner; trading partner code; award date; and amounts increased and/or decreased.

- Acquisition and financial management staff independently update the same types of data into independent financial and contract management systems.
- Financial management systems fail to provide transaction details to support account balances or identify the method of acquisition, lack evidence that the contractor's final invoice has been submitted and paid, or fail to perform other transaction processing and routine accounting activities adequately.
- Inadequate transaction processing, particularly improper payments, occur frequently.
- Financial management systems fail to include the taxpayer identification number for contractor identification and income reporting and debt collection purposes.

The agency receives a qualified, disclaimed, or adverse audit opinion, which may indicate poor accountability.

- Auditors note weaknesses in the agency's acquisition or financial management function in the agency's audit report.

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