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Hayes, Richard D.

NAVAL POSTGRADUATE SCHOOL
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CONTRACTING STRATEGY FORMULATION FOR
PRODUCTION COMPETITION IN MAJOR
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by

Richard D. Hayes

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Thesis Advisor: David V. Lamm

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Contracting Strategy Formulation for Production Competition in Major Weapon Systems Acquisition

by

Richard D. Hayes
Lieutenant Commander, Supply Corps, United States Navy
B.S., United States Naval Academy, 1974

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requirements for the degree of

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from the

NAVAL POSTGRADUATE SCHOOL
December 1985

ABSTRACT

Production competition has emerged as a major objective in major weapon systems acquisition. The complexity and length of the acquisition process, and the expense involved in major weapon systems requires that early and careful planning be conducted in order to achieve production competition. In this study, the researcher defines and identifies the characteristics and roles of the acquisition strategy, the acquisition plan, functional implementation plans, and the contracting strategy. The concept of production competition and the feasible methodologies for pursuing it are investigated. Contracting strategy formulation is studied in detail and program issues that are consistently encountered in contracting strategy formulation are presented. A methodology for identifying problem issues in contracting strategy formulation is developed and analyzed. The study concludes that the role of the contracting officer and the contracting strategy is not sufficiently recognized nor defined in the critical role of integrating functional requirements and objectives into an integrated acquisition plan.

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I. INTRODUCTION

A. GENERAL

Production competition has recently emerged as an important goal in the acquisition of major weapon systems. It is, in fact, a legal mandate. Advantages to be derived by the Department of Defense from competitive procurement include:

- Obtaining a lower price for a product
- Obtaining a higher quality product
- Expanding the industrial base
- Enhancing surge capability in an emergency
- Providing more than one source for product innovation
- Stimulating research and development
- Encouraging efficiency
- Encouraging receptiveness to the concerns of the buyer and to address criticisms

Production competition can only be achieved as the result of careful early planning by the Program Manager (PM) and his supporting acquisition management team. This planning is documented in the acquisition strategy, acquisition plan, and various functional implementation plans. One key functional implementation plan is the contracting strategy as formulated by the contracting officer. The contracting officer receives guidance for the contents of the contracting strategy through various procurement regulations, supplements, instructions, and directives.

This study will investigate and analyze a proposed methodology that will aid the contracting officer in formulating a contracting strategy for production competition.

B. OBJECTIVES OF THE RESEARCH

The objectives of this study were: (1) to investigate the contracting officer's role in acquisition strategy development, (2) to investigate the concept of the acquisition strategy and its development, (3) to identify methodologies for establishing production competition, (4) to identify the key factors to be considered in contracting strategy formulation, and (5) to develop a methodology for contracting strategy formulation.

C. RESEARCH QUESTIONS

To achieve the objectives of the research, the following question was posed: What are the key factors that must be included in the contracting strategy for a major weapon system in order to achieve production competition?

To answer the basic research question, the following subsidiary questions were addressed:

1. What is a contracting strategy, and what is the contracting strategy's role in a major weapon system acquisition?
2. What are the principal contracting characteristics of production competition, and what are the feasible production competition options/alternatives?
3. What contingent characteristics of major weapon systems acquisition pre-production phases might substantively jeopardize the structure, nature and emphasis of the production competition strategy?

4. What are the contracting issues that must be considered from a political, legal, economic, and regulatory perspective in formulating and implementing a production competition strategy?

D. RESEARCH METHODOLOGY

The information presented in this study was obtained from currently available procurement related literature, personal interviews with contracting officers and program management office personnel. Literature was obtained from the Naval Postgraduate School Library, Defense Technical Information Center, Defense Logistics Studies Information Exchange and applicable regulations, directives, and instructions that govern the acquisition process. Personnel interviewed during the research effort are identified in the References and the interview questions are listed in the Appendix.

E. SCOPE AND LIMITATIONS

This study is limited to major systems acquisition as currently practiced by the Department of Defense (DOD). The thrust of the study was on the formulation process of a major weapon system contracting strategy and its role in implementing the objectives of the system acquisition strategy. In-depth study of the various functional implementation plans was limited to their interrelationship within the umbrella of the acquisition plan.

F. ORGANIZATION OF THE STUDY

The organization of the study is designed to present a logical progression toward an understanding of the acquisition

strategy, acquisition plan, the various functional implementation plans, and specifically the contracting strategy as formulated to achieve production competition. Chapter II presents a conceptual discussion of the major weapon system environment, the acquisition process, and the aforementioned strategies and plans. Chapter III introduces the concept of production competition and discusses the feasible options/alternatives of establishing production competition. Chapter IV identifies major weapon system acquisition program issues which the research consistently encountered in contracting strategy formulation, and applies those issues to the various production competition alternatives. A methodology for identifying potential areas of concern in contracting strategy formulation is thereby developed. Chapter V applies this methodology to two actual programs in order to analyze its utility. Finally, Chapter VI provides the conclusions and recommendations developed as a result of this study, provides answers to the research questions, and provides recommendations for further study.

II. THE CONTRACTING STRATEGY IN PERSPECTIVE

A. INTRODUCTION

It is the purpose of this chapter to bring the contracting strategy in major weapon systems acquisition into perspective. The framework for investigation into the contracting strategy will be created first by a discussion of the environment and the process of major weapon systems acquisition. Next, the acquisition strategy will be defined and discussed in relation to its role in the major weapon systems acquisition process. Finally, the contracting strategy will be defined. Its function and considerations will be presented to establish its position and role within the overall process.

B. THE MAJOR WEAPON SYSTEMS ACQUISITION ENVIRONMENT

Major weapon systems are acquired by the Department of Defense (DOD) to provide operational military forces hardware resources that will enable them to accomplish DOD objectives and policies. Operational requirements are established by analyses of threats, mission area analyses, and net assessments of capabilities and shortfalls. When it is determined that operational requirements exceed existing capabilities, new programs are initiated. [Ref. 1:p. 2-1] The Military Departments have been delegated responsibility for managing the acquisition programs for major weapon systems. [Ref. 1:p. 2-10]

1. The Major Weapon System Acquisition Players

Acquiring these major weapon systems is a complex and challenging process [Ref. 1:p. 1-1]. Significant players have emerged that affect the planning and execution of defense acquisition programs. The President establishes overall national security policies and objectives. [Ref. 1:p. 2-3] The Office of the Secretary of Defense (OSD) has the responsibility to develop the strategy to expand, modernize, and support the forces to carry out the President's policies and objectives. It also has the responsibility for establishing acquisition policy to ensure that major programs are initiated in response to specific needs and are prudently managed. [Ref. 1: p. 2-10] The Military Departments implement OSD policies, develop system micro-acquisition strategy, and assign Program Managers (PM) to conduct specific programs. [Ref. 1:p. 2-3] Congress authorizes and appropriates the money for defense programs. In recent years, it has become steadily more involved in the details of the acquisition process. It has added specific constraints and objectives to certain individual programs in authorization and/or appropriation bills. [Ref. 1: p. 2-3] Industry is an inherent player in the process, since it participates through contractual relationships with the Military Departments. [Ref. 1:p. 2-3]

At the hub of the major weapon system acquisition process is the Program Manager (PM). He is the primary advocate of the program. The Military Department charters the

PM to exercise technical and business/financial management for the accomplishment of the program objectives within approved constraints and thresholds. [Ref. 2:p. 2-1] In order for the PM to successfully manage his program, functional support must be provided by specialists such as a business/financial manager, a logistics manager, a technical manager/systems engineer, and a contracting officer. [Ref. 2:p. 2-11] The PM and his supporting functional specialists must continually take into account the roles, concerns, and possible actions of players in the Executive and Legislative Branches, DOD, Military Departments, and industry while planning, developing, and executing a major weapon system acquisition program. [Ref. 1:p. 2-1]

2. Major Weapon Systems Acquisition Guidelines

The statutory base upon which the major weapon systems acquisition process has evolved is the Armed Serivces Procurement Act (ASPA) of 1947 [Ref. 3:pp. 6-8]. Since enactment, changes have been continually made in response to emerging problems, national social and economic issues, annual authorization and appropriation directives, and other legislative acts and executive orders. This has resulted in a "system" built upon a fragmented collection of statutes, policies, and implementing regulations with narrow application to resolve many individual problems. [Ref. 3:p. 6] In addition to the basic statute, over four thousand other legistlative provisions affect the procurement process. [Ref. 3:p. 8] Procurement

legislation has increased in recent years with significant impact upon the major weapon systems acquisition environment. Among the significant areas affected include the requirement for warranties on major weapon systems [Ref. 4], and the elimination of the preference for formal advertising [Ref. 5]. Sealed bidding is now preferred, with competitive negotiation to be used when sealed bidding is not practical. Competition is required, and organizational competition advocates have been established. [Ref. 5]

C. THE MAJOR WEAPON SYSTEMS ACQUISITION PROCESS

1. Evolution

The major weapon systems acquisition process, as currently practiced, emerged from a study by the Blue Ribbon Defense Panel in 1970, and the promulgation of DOD Directive 5000.1, titled Major Weapon System Acquisitions, in 1971. The evolution further progressed with the issuance of Office of Management and Budget (OMB) Circular A-109, titled Major Weapon System Acquisitions, in 1976. The policies and guidelines expressed in these documents form the basis for all subsequent procedural directives and instructions regulating DOD acquisition of major weapon systems. They enable the Secretary of Defense (SECDEF), aided by the Defense Systems Acquisition Review Council (DSARC), to guide and control the development and production of major weapon systems through top management oversight of a series of acquisition phases,

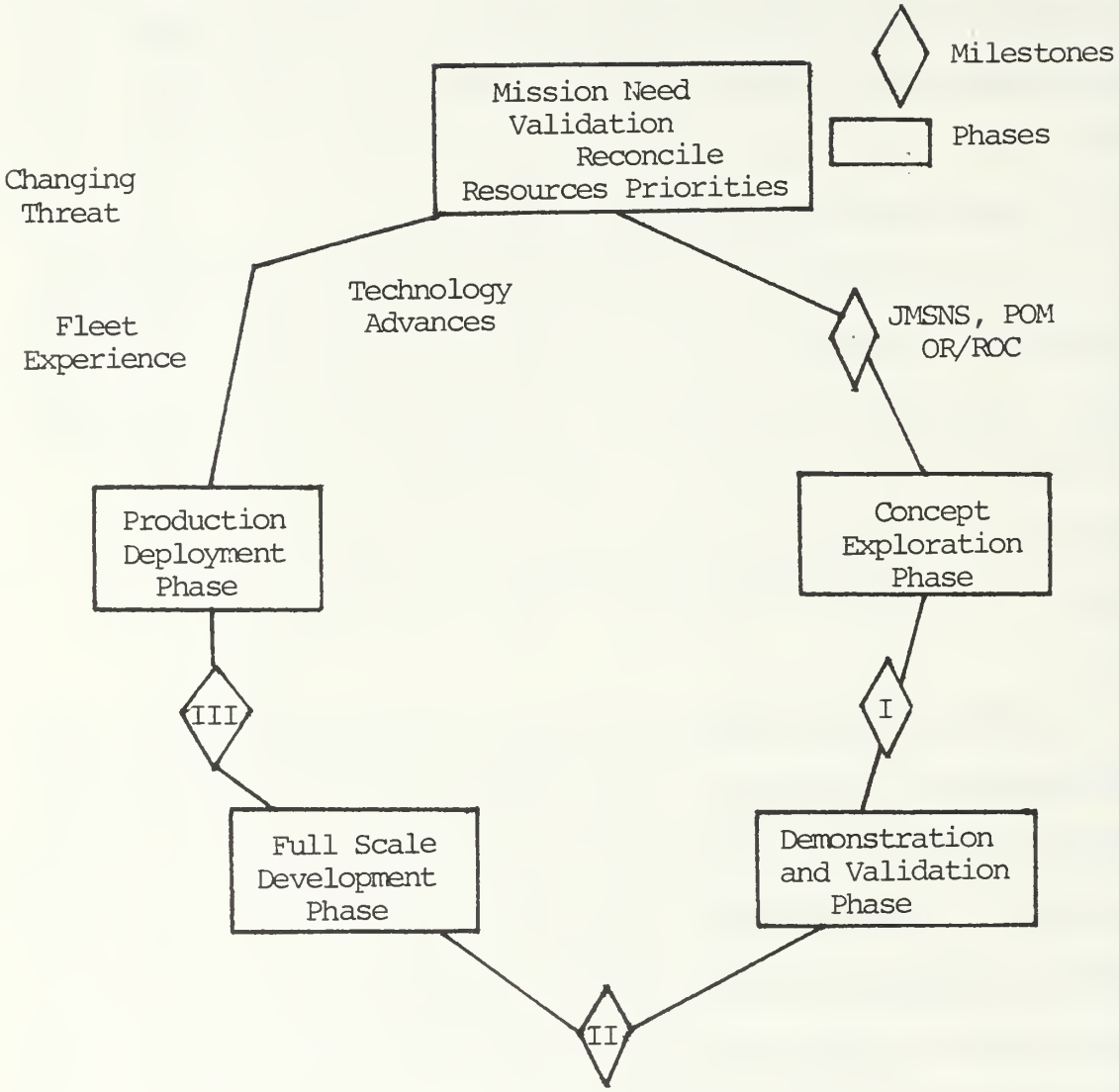
milestone reviews, and decision points. Figure 2.1 is a representation of the major weapon systems acquisition process.

2. Phases and Milestone Reviews

The acquisition of a new major weapon system begins with either an identified deficiency in an existing capability, a decision to establish new capabilities in response to a technologically feasible opportunity, a significant opportunity to reduce the DOD cost of ownership, or in response to a change in national defense policy [Ref. 4: p. 4].

The military Service documents the need for the major weapon system by preparing a Justification for Major System New Start (JMSNS) and submits it into the Planning, Programming, and Budgeting System (PPBS) process with the Service Program Objective Memorandum (POM) for the year in which the funds are requested. SECDEF approval establishes the mission need determination and authorizes the military Service to initiate the program when the funds are available.

The first phase is the Concept Exploration (CE) phase. During this phase, several contracts are awarded to industry to identify and investigate alternative system design concepts that will satisfy the mission need. At the conclusion of the CE phase, the PM recommends that one or more of the alternative design concepts be carried forward into the Demonstration and Validation (D&V) phase. This recommendation is made in the



Source: Adapted from [Ref. 2:p. 1-13]

Figure 2.1. Major Weapon System Acquisition Phases and Milestones

System Concept Paper (SCP) which summarizes the results of the CE phase and describes the program's acquisition strategy. The SECDEF, aided by the DSARC, uses the SCP to make the Milestone I decision. Approval signifies a validation of the requirement and is authorization to proceed with the D&V phase with the most promising concepts. [Ref. 4:p. 5]

The purpose of the D&V phase is to further develop and validate the alternative concepts to determine which concept(s) should progress into the Full Scale Development (FSD) phase. This involves demonstration of the system or critical subsystems to verify performance and potential suitability of the concept to fill the mission need. [Ref. 2: p. 1-15] The results of the D&V phase are submitted to the DSARC for the Milestone II decision point. Documentation includes a Decision Coordinating Paper (DCP)/Integrated Program Summary (IPS), which expand the information in the SCP and provides more detailed program data. SECDEF/DSARC approval authorizes the program to proceed into the FSD phase.

The purpose of the FSD phase is to produce a fully tested, documented, and production-engineered design of the selected concept [Ref. 2:p. 1-15]. Activities in this phase include an engineering subphase, a prototype subphase, and a pilot-production/transition to production subphase. The final milestone decision point, Milestone III, is to decide to proceed into the Production and Deployment phase. The decision is delegated to the Service Secretary, provided the

thresholds established at Milestone II are met. The decision is based upon a review of the updated DCP/IPS and the updated acquisition strategy. [Ref. 4:p. 5] The acquisition process terminates at the end of the Production and Deployment phase.

D. THE MAJOR WEAPON SYSTEMS ACQUISITION STRATEGY

> The first function of management is the development of a series of plans that establish the framework within which future activities will be conducted. [Ref. 6:p. 451]

> More than any other single factor, careful planning is the hallmark of a successful program. [Ref. 2:p. 3-15]

> Problems incurred in a program are inversely proportional to the amount of planning. [Ref. 2:p. 3-15]

One of the major weapon systems acquisition management objectives stated in OMB Circular A-109 is to tailor an acquisition strategy for each program. This is to be accomplished as soon as the agency decides to solicit alternative design concepts that could lead to the acquisition of a new major system. The acquisition strategy is to be refined as the program proceeds through the acquisition process. [Ref. 7: p. 5] DOD 5000.1 directs that DOD components shall achieve program stability through five procedures, one of which is to [Ref. 4:p. 2]:

> Develop an acquisition strategy at the inception of each major acquisition that sets forth the objectives, resources, management assumptions, extent of competition, proposed contract types, and program structure (such as development phases decision milestones, test and evaluation periods, planned concurrency, production releases) and tailors the prescribed steps in the major system acquisition decision making process to this strategy.

1. Definitions

Procurement literature and conversation within and outside of the Government frequently utilize the terms acquisition planning, acquisition plan, and acquisition strategy synonymously. Therefore, for the purposes of this thesis, the following definitions are presented:

a. Acquisition planning is the process by which the efforts of all personnel responsible for an acquisition are coordinated and integrated through a comprehensive plan for fulfilling the agency need in a timely manner and at a reasonable cost. It includes developing the overall strategy for managing the acquisition. [Ref. 8:p. 7-1]

b. The acquisition strategy is the conceptual basis of the overall plan that a Program Manager follows in program execution. It is the framework for planning and directing the program. [Ref. 1: p. 1-1] Broadly treated at the inception of a program where many options are available, it evolves through an iterative process into a plan which describes the interweaving of business, technical, and other aspects of the program and identifies the requisite actions by the Program Manager for achieving program objectives. [Ref. 9:p. 1]

c. The acquisition plan specifically addresses the immediate procurement action. [Ref. 1:p. 4-5] It integrates and summarizes information found in more detail in the various program functional plans. It becomes increasingly detailed as the acquisition progresses.

d. Functional implementation plans present the specific actions, concerns, and schedules relating to a particular functional area. They contain short-term tasks, inputs, outputs, schedules, sub-milestones, and man-loading. In other words, they are the detailed plans for implementing the applicable broad-based portion of the acquisition strategy. They, too, are updated as the acquisition progresses. [Ref. 2:p. 4-4] Examples of functional implementation plans include the Business/Financial Management Plan, the Integrated Logistics Support Plan, the Test and Evaluation

Master Plan, and the Systems Engineering Master Plan. Other functional plans may be required, depending upon the circumstances of the acquisition.

To summarize the relationships between the acquisition strategy and the various plans, acquisition planning is employed to formulate and integrate the acquisition strategy and all other associated functional plans. The acquisition strategy provides the broad issues to be addressed throughout the life of the program. [Ref. 1:p. 4-5] The functional implementation plans contain the planning details for achieving acquisition strategy objectives in a particular functional area. The acquisition plan integrates and summarizes the various functional plans into a detailed overall functional plan that addresses the immediate procurement action.

2. Acquisition Strategy Characteristics/Maintenance

The primary purpose of a major weapon system acquisition strategy is to provide a coordinated approach to accomplishing program objectives in a timely and economical manner [Ref. 1:p. 3-1]. It is the baseline from which all functional plans are developed. It provides the groundrules and assumptions under which the program was initiated. It identifies, evaluates, and selects important issues, functional requirements, and critical decision windows. It provides an agreement upon the plans and activities of the program between the Program Manager and the Military Department. It can also be utilized to establish support for a program with OSD, the President, and/or the Congress.

[Ref. 1:p. 3-2] In its broadest conceptualization, an acquisition strategy identifies and addresses the integration of strategic, technical, and resource concerns in order to define program objectives and to achieve program direction and control. [Ref. 1:p. 3-3]

OMB Circular A-109 directs that major weapon systems acquisition strategies be refined as the program proceeds through the acquisition process [Ref. 7:p. 5]. Three situations have been identified as being primary instigators of acquisition strategy updates of modications: (1) program changes or problems, (2) insufficient resources, and (3) acquisition cycle phase changes. [Ref. 1:p. 4-8]

E. THE MAJOR WEAPON SYSTEMS CONTRACTING STRATEGY

1. General

The acquisition strategy provides the conceptual framework for program execution. It addresses strategic, technical, and resource areas of concern. The strategic areas of concern provide the basis upon which tailored approaches can be developed to address the elements in the technical and resource areas of concern. These tailored approaches are termed functional strategies. They include areas such as design, test and evaluation, production, deployment, personnel and organization, schedule, business/financial, management information, and facilities. [Ref. 1: pp. 3-2,9] These functional strategies always receive their direction, priorities, and constraints from the acquisition

strategy. [Ref. 1:p. 3-5] Various functional specialists supporting the Program Manager develop these functional strategies and translate them into functional implementation plans. These functional implementation plans are then integrated into an overall acquisition plan. The acquisition plan implements the objectives of the acquisition strategy via the detailed functional strategies to the instant procurement action. [Ref. 1:p. 4-5]

2. Definition

The contracting strategy is the procurement portion of the business/financial functional strategy. It provides immediate detailed approaches to acquisition strategy contractually-related resource concerns.

3. Considerations and Components

No definitive guidance for development of a separate and formal functional strategy for contracting was encountered. Interviewees included in the References stated that they utilized their experience and the existing program circumstances in formulating a contracting strategy. Considerations and components of a contracting strategy must be extracted from OMB Circular A-109, Federal Acquisition Regulation (FAR) Part 7 on acquisition planning, DOD FAR Supplement Part 7 on acquisition plans, and applicable Service supplements, directives, and instructions. Key considerations in a contracting strategy are that it be consistent with program objectives and within the framework and direction

of the acquisition strategy. It should also serve to integrate the other functional strategies into a cohesive acquisition plan that addresses the instant prccurement action.

F. SUMMARY

This chapter has provided a broad overview of the environment and process of acquiring major weapon systems. The complexity, length, and cost of a major weapon system program requires early and careful planning. The development and maintenance of a formal planning document that provides the broad conceptual framework for the execution of the program throughout its life is critical.

The acquisition strategy provides the broad direction, priorities, and constraints to the development of the various functional strategies. These functional strategies implement the acquisition strategy in the short term for the instant procurement action in their specific functional area. When integrated, they constitute the acquisition plan.

The contracting strategy is a critical functional strategy that enumerates the contractually related objectives and plans and should integrate the other functional strategies. A contract can thereby be formed that bridges the gap between the Government (buyer) and Industry (seller).

There is no formal guidance for the preparation of a contracting strategy. Additionally, there is not a requirement for a separate contracting strategy document.

III. PRODUCTION COMPETITION

A. INTRODUCTION

This chapter will introduce and define the concept of competition in the major weapon systems acquisition environment. The statutory and regulatory basis for the preference for competition is introduced, and the relatively recent emphasis upon production competition is presented. The last section of the chapter will present the recognized methods for establishing alternative sources for production of major weapon systems. Each method will be briefly described, followed by advantages and disadvantages that have been attributed to each. An understanding of these second sourcing methodologies is necessary to discuss the development and implementation of contracting strategies that have production competition as a goal.

B. COMPETITION IS A LEGAL MANDATE

The concept of competition has long been imbedded in American society. It is a legal and regulatory mandate in the acquisition of defense goods and services. [Ref. 10: p. 1-3] The DOD and Congress have historically expressed preference for competition through legislation, regulations, and instructions.

Congressional preference for competition is expressed through legislation. The statutory base for the major weapon

systems acquisition process, ASPA 1947, requires that contracts for property or services be formally advertised. Negotiation is to be used only under specific circumstances, and it must be competitive whenever practicable. [Ref. 10: p. 1-3] There have been numerous subsequent legislative initiatives designed to further increase competition. The Competition In Contracting Act of 1984 (CICA) amended ASPA placing further emphasis upon competition and made far reaching procedural changes to implement that emphasis. [Ref. 5] It requires the use of competition, except under seven unusual circumstances. As previously discussed, sealed bidding is now the preferred procurement method, however competitive negotiation is now on equal footing, since CICA eliminated the exceptions allowing negotiation.

Recently, Congressional interest in production competition has been reflected. The DOD Appropriations Act of 1984 directs that major weapon acquisition programs cannot enter FSD until SECDEF has provided Congress either a plan for the development of two or more production sources or a certification that the quantities being procured are not sufficient to warrant development of two or more production sources. [Ref. 4] CICA also enhanced the ability to develop production competition by enabling the head of an agency to exclude a particular source from competitive procedures in order to develop or maintain an alternate source or sources of supply [Ref. 5]

The Executive Branch and DOD have reflected the preference for competition in their policy and procedures implementing memoranda, directives, and instructions. OMB Circular A-109 directs the incorporation of competition throughout the acquisition for major weapon systems. [Ref. 7:p. 8] The FAR and the DOD FAR Supplement direct, in Subparts 14 and 15, that contracts shall be awarded on a competitive basis. DODD 5000.1 directs effective competition as one of the primary acquisition principles. [Ref. 4:p. 2]

Effective production competition is, therefore, required by law and regulation in the acquisition of major weapon systems, whenever practicable. It is an issue that must be addressed in a major weapon system contracting strategy.

C. DEFINITIONS

Various concepts and types of competition must be defined in order to clarify further discussion in this effort:

1. Competition is defined as rivalry among companies for markets. [Ref. 1:p. 5-2]

2. Price competition is based upon the lowest offered price when market analysis reveals equal or similar products will satisfy a particular need. Evaluation is based upon price alone. [Ref. 11:p. 156]

3. Design competition is present when two or more companies develop competing conceptual, technical design approaches to satisfy a need. [Ref. 1:p. 5-2] It involves development of competing solutions to a mission need. [Ref. 10:p. 1-8]

4. A multiple factors competition is based upon price, cost, and other factors such as design, performance, service, delivery, technical, and management capability. [Ref. 11:p. 156]

5. Production competition is present when two or more companies bid or propose to secure all or part of a production contract [Ref. 1:p. 5-2]. It involves maintaining multiple suppliers of identical or functionally identical equipment. [Ref. 10:p. 1-11] Production competition can also be viewed in light of the number of production sources and the number of competitions held. The number of production sources refers to the number of sources maintained over time, such as winner-take-all or split-buy. [Ref. 10:p. 1-13] The number of competitions held refers to the number of times during the production phase that competitive awards are made. [Ref. 10:p. 1-13]

D. ESTABLISHING COMPETITIVE PRODUCTION SOURCES

There are five recognized methods for transferring production technology and establishing competitive production sources. These are: (1) Form, Fit, and Function (F^3), (2) Technical Data Package (TDP), (3) Leader-Follower, (4) Licensing, and (5) Contractor Teaming. [Ref. 1:p. 5-3] These methodologies are not always appropriate to the program circumstances. The benefits of competition at levels other than the prime contractor may be more effective. It has been stated that competition at the prime contractor level has little effect if a large portion of the system is subcontracted, since the prime contractor would control only a small portion of the costs. [Ref. 10:p. 2-21] Production competition of key subsystems or components may serve to better realize the benefits of competition. Design competition is another method under which production can be competitively obtained.

1. Form, Fit, and Function

The Form, Fit, and Function (F^3) technique involves the solicitation of alternative suppliers based upon performance and interface specifications, allowing maximum design and manufacturing flexibility [Ref. 10:p. 2-1]. The potential second source is provided functional specifications that define parameters such as overall performance, size, weight, external configuration, mounting provisions, and interface requirements. This is the classic "black-box" concept. [Ref. 12:p. 13] It is not necessary to define the internal workings of the system. This technique has been successful for the acquisition of expendable, non-repairable items whose successful performance does not depend upon its internal design. [Ref. 12:p. 13]

The advantages of F^3 include [Ref. 10:p. 2-2;Ref. 12: pp. 13,14]:

a. No technical data package is required.

b. The contractor assumes total design responsibility.

c. Contractor-to-contractor interface is not required.

d. Only minimal Government technical capability is required.

e. There is a maximum potential unit production cost reduction due to competition, particularly with parallel development.

f. Performance and interoperability are possible.

The disadvantages of F^3 include [Ref. 10:p. 2-3; Ref. 12;p. 14]:

a. Each procurement requires development effort, except for off-the-shelf items, which requires additional time and money.

b. Contractors unaware of the real effort required to meet the F^3 specification are likely to be the lowest offerors.

c. Careful specification of all external parameters and interface requirements is required to ensure interchangeability.

d. System performance or interface instability impairs F^3 effectiveness.

e. End items with different internal design populate the inventory, requiring different spare parts and test equipment.

f. Spare parts may be monopolistically priced by the manufacturer of each unique configuration.

2. Technical Data Package

The Technical Data Package (TDP) method involves the utilization of a stand-alone technical data package to solicit production proposals from potential alternative manufacturers [Ref. 12:p. 14]. They may or may not have participated in the system development or initial production. This method is dependent upon a data package that, by itself, is sufficiently detailed, yet universally acceptable for any alternative manufacturer to use in producing the system. The data package is obtained through invocation of a data rights clause or the outright purchase of the data. The Government, once in possession of a data package, must validate its adequacy.

Advantages of TDP with independent verification include [Ref. 10:p. 2-6;Ref. 12:p. 14]:

a. Possession of an adequate TDP enables the Government to maintain a competitive environment throughout the life of the program.

b. Second sourcing procedures are relatively simple after obtaining an adequate TDP.

c. Contractor-to-contractor interface is eliminated.

Disadvantages of TDP include [Ref. 10:pp. 2-6,2-7; Ref. 12:p. 14]:

a. It is not suited for highly complex systems or systems with unstable designs or technologies.

b. The TDP alone may not adequately transfer the manufacturing technology, i.e., skills and processes.

c. Once the Government accepts and validates the TDP, it assumes responsibility for its accuracy and adequacy. Any defects could result in delays and/or claims from the second source.

d. TDP's are difficult to obtain due to contractor's assertions of proprietary data.

3. Leader-Follower

The Leader-Follower technique establishes a second source through direct contractor-to-contractor transfer of technical data [Ref. 10:p. 2-9]. The FAR considers it an extraordinary procurement, and in Subpart 17.4 restricts its use to the following circumstances [Ref. 8]:

(1) The leader company has the necessary production know-how and is able to furnish required assistance to the follower.

(2) No other source of supply can meet the Government's requirements without the assistance of the leader company.

(3) The assistance required of the leader company is limited to that which is essential to enable the follower company to produce the items.

(4) Its use is authorized in accordance with agency procedures.

The FAR also prescribes three methods in which to accomplish Leader-Follower technology transfer [Ref. 8]:

(1) Award a prime contract to the leader company, obligating it to subcontract a designated portion of the items to a specified follower company, and to assist it to produce the items.

(2) Award a prime contract to the leader company for the required assistance to the follower company, and a prime contract to the follower company for production of the items.

(3) Award a prime contract to the follower company, obligating it to subcontract with a designated leader company for the requisite assistance.

Advantages of the Leader-Follower method include [Ref. 10:p. 2-10; Ref. 12:p. 16]

a. It provides a technique for transferring all or part of the production of a complex system to a second source.

b. Competition can be utilized to determine the acquisition split award to each qualified producer when two or more sources are maintained.

c. Government liability associated with the technology transfer is limited.

The disadvantages of Leader-Follower include [Ref. 10:p. 2-10;Ref. 12:p. 16; Ref. 13:p. 6-5]:

a. If proprietary/patented data and techniques are involved, it resembles Directed Licensing.

b. It may be difficult to motivate the leader to participate.

c. It may have limited economic benefit as a competitive strategy.

d. It may require complex contractual relationships between the parties. The Government may have to mediate conflicts.

e. It is difficult to maintain Government configuration control.

f. There are no royalty or assistance fee provisions. There is no licensing protection.

4. Directed Licensing

Directed Licensing involves either the inclusion of a clause in the development contract or a later negotiation whereby the Government reopens follow-on production competition [Ref. 12:pp. 14-15]. A potential second source is designated a licensee to the developing contractor (licensor). The developer, in return for a royalty or fee, provides manufacturing data and technical assistance to enable the licensee to become a qualified producer of the system. The developer retains the rights to all proprietary data and maintains system responsibility. The licensee has only the granted permission to manufacture the system, and normally may only use the technology for the one program. There has also been a trend whereby the developer chooses his own licensee, subject to Government approval. [Ref. 10:p. 2-13]

The advantages of Directed Licensing include [Ref. 10:p. 2-14; Ref. 12:p. 15; Ref. 13]:

a. A substantial portion of the development is funded by private investment.

b. The potential for production is maintained throughout the acquisition cycle.

c. The Government is not closely involved with the technology transfer process.

d. The developer has protection as to how, or in what markets, the licensee may sell the product. The developer may also be compensated for each item the licensee produces.

The disadvantages of Directed Licensing include [Ref. 10:p. 2-15; Ref. 12:p. 15; Ref. 13:p. 6-4]:

a. The Government may be unable to break the licensee away from the developer.

b. Limited economic benefit from competition due to fees and/or royalties.

c. Limited Government configuration control.

d. Technical transfusion is slow, since the developer retains data rights.

e. Developer controls the ultimate success of the technology transfer and the schedule of the first production competition.

f. Potential licensees may only participate in order to obtain the developer's technology.

5. Contractor Teaming

In Contractor Teaming, potential sources form teams of two or more contractors, either by a prime-subcontractor relationship or as a separate entity or joint venture [Ref. 10:p. 2-17]. The teams then compete in the system development through FSD. The winning team selected for production exchanges technical data and manufacturing technology. During the initial production run, each contractor must demonstrate the capability to produce the entire system. The team relationship is then dissolved, and the contractors compete for follow-on production contracts.

The advantages of Contractor Teaming include [Ref. 10: p. 2-18; Ref. 12:p. 16; Ref. 13:p. 6-3]:

a. Second sources are developed as part of the process.

b. No royalties or fees are involved.

c. Technical success is enhanced by the efforts of two contractor's design talent.

d. Government liability of technical data is limited.

e. Potentially can result in production competition in the first production lot.

f. A good competitive base is established very early in the equipment life cycle.

The disadvantages of Contractor Teaming include [Ref. 10:pp. 2-18,19; Ref. 12:p. 16; Ref. 13:p. 6-3]:

a. The design phase is more costly, since at least two contractors are involved with each proposal.

b. The Government may have to resolve technical/contractual conflicts within the team. It is a complex arrangement.

c. It requires substantial Government effort to maintain configuration control.

d. FSD division of labor must be overcome to allow independent production of the complete system by both contractors.

e. There is weak Government leverage to maintain the partnership throughout the technology transfer process.

f. The team may attempt to behave as a single monopolistic entity.

g. Care must be exercised concerning antitrust problems.

6. Component Breakout

Production competition at lower tiers can be effected by various means. The most common techniques employed involve either requiring the prime contractor to develop the subsystem/component alternative sources, or the PMO breaks out the subsystem/component and conducts a separate production for them directly with the suppliers. [Ref. 10:p. 2-22]

The prime contractor can be required to identify key subcontracted subsystems and/or components and to procure them competitively. Under this method, the prime contractor conducts the competition, performs source selection, and procures the subsystem/component subject to Government approval. The prime contractor assumes full responsibility for the equipment and for qualification of the second source. The prime contractor then integrates the subcontracted subsystems/components and delivers them to the Government as contractor-furnished equipment (CFE). [Ref. 10:p. 2-23]

The other approach to subtier production competition requires more PMO involvement. Under this approach, the PMO identifies key subcontracted subsystems/components and conducts production competition strategies directly with suppliers. Any of the technology transfer techniques may be utilized to pursue subtier production competition, depending upon the circumstances surrounding the subsystem/component. The PMO then provides the subsystem/component to the prime contractor for integration as Government-furnished equipment (GFE). [Ref. 10:p. 2-24] This approach enables the Government to obtain the subsystem/component at a competitive price while reducing the overhead and fee layering of the prime contractor. There are, however, disadvantages to the GFE approach. Much more PMO involvement is required to manage the additional subsystem/component suppliers in addition to the prime contractor. Additionally, Government administration of the subsystem/component

contracts is increased, since these contracts must receive the same contract administration as the prime contract, and the subsystem/component must be tested and accepted by the Government. Another disadvantage is the increased risk and liability assumed by the Government by certifying the subsytem/component. If the prime contractor encounters difficulty in integrating the GFE due to schedule or design/performance deficiencies, the Government may be held liable for the deficiencies. [Ref. 10:p. 2-24]

7. Design Competition

Production competition for a major weapon system can be established by conducting parallel design competition through FSD. At the end of the FSD phase, the contractor with the best technical approach within affordable costs is awarded the production contract. The disadvantage to this approach is that while the initial production contract is competitive, the developer is subsequently the sole source. In order to maintain production competition after the first production contract, the methodologies for establishing second sources described earlier must be initiated. Additionally, early planning and actions must have been accomplished in order to promptly establish additional sources under these methodologies, such as obtaining an accurate TDP and unlimited rights to the data, negotiating future royalty payments, or defining subsequent technology transfer arrangements.

E. SUMMARY

This chapter has introduced the concept of competition in major weapon systems acquisition. Congress and DOD have rejuvenated their long-standing interest and emphasis upon competition. This attention has focused upon competition in the major weapon systems acquisition production phase. DOD is now required by law to plan for developing alternative production sources before entering the FSD phase of the major weapon systems acquisition cycle. Planning for production competition is, therefore, a significant factor in developing and implementing a major weapon system contracting strategy.

Several methodologies for establishing alternative production sources have been presented. These methodologies provide different characteristics, advantages, and disadvantages as acquisition vehicles for achieving a production competition environment. They must be closely analyzed in relation to the objectives of the acquisition strategy and overall program issues. A direction can then be identified toward formulation of the contracting strategy.

IV. MAJOR WEAPON SYSTEM CONTRACTING STRATEGY FORMULATION

A. INTRODUCTION

The purpose of this chapter is to investigate issues and methodologies involved in formulating a contracting strategy for a major weapon system acquisition. Contracting issues in early major weapon system acquisition cycle phases related to establishing a future environment for production competition will be discussed. At some point in the major weapon system acquisition process, a decision must be made as to which of the available methods presented in Chapter III for establishing alternative production sources will be employed. This decision process is briefly discussed. Once the decision is reached, it is incorporated into the system acquisition strategy as a program objective. Functional strategies that implement the selected methodology must then be formulated and integrated into an acquisition plan. The final sections of this chapter will discuss the role of the contracting strategy.

Contracting officers interviewed indicated that there is no definitive guidance on formulating a contracting strategy. Most stated that they are usually the final reviewer of the proposed functional strategies. The contracting officer then used his best efforts to preclude conflicts between the functional strategies and his tentative contracting intentions. After resolving any conflicts and incorporating the contracting

strategy, an acquisition plan was established. Interviewees preferred no formal guidance on contracting strategy formulation and review. They stated that they needed freedom of judgment and flexibility to work within the unique and changing circumstances of each program.

The researcher will analyze techniques that allow a contracting officer to formulate a contracting strategy by integrating program issues from the various functional strategies and then analyzing the potential suitability of the selected method for establishing alternative production sources for accommodating those program issues.

B. CREATING A COMPETITIVE CONTRACTUAL ENVIRONMENT

"No decision is isolated in time; every move opens some future opportunity for decision, and forecloses others. Therefore, every decision commits positively or negatively, and at the same time, reduces future options" [Ref. 14:p. 11].

Early planning is the key to the potential success of production competition [Ref. 11:p. 157]. Planning must be carefully accomplished early so that decisions made in the Concept Exploration and Demonstration and Validation phases do not foreclose the future opportunity for production competition. In other words, the foundation for production competition should be laid while the program is under the positive influence of design competition. [Ref. 10:p. 1-11] In this way, early decisions support the future production competition

opportunity. Contractors' responses are also more favorable in a competitive environment.

The initial contracting strategy, formulated prior to Milestone I, supports a very broad program acquisition strategy. It is, therefore, also a broad contracting strategy concerning future production competition that implements the Concept Exploration objective of contracting for several alternative concepts that may satisfy the DOD mission need. It should, however, address specific contracting issues related to the Demonstration and Validation phase that could lay the foundation for future production competition. The contracting strategy should outline D&V phase solicitation provisions that will allow maximum future flexibility in the subsequent decision as to which methodology to pursue that establishes alternative production sources, i.e., F^3, TDP, etc. These provisions could include, as a minimum:

1. Inform all potential contractors of the Government's intention to pursue production competition [Ref. 13: pp. 6-16,22]. This notifies potential contractors up front that the major weapon system acquisition process will be competitive, and that technology transfer will be an eventual requirement. In other words, contractors will not be surprised later in the process by the Government's efforts to establish an alternative source. Contracting officers interviewed stated that previous sole source contractors frequently employ delaying tactics and other barriers upon first knowledge of the Government's intention to develop an alternative source.

2. The requirement for the preparation of a complete and accurate performance specification to the subsystem level [Ref. 13:pp. 6-16,22]. This provides the capability to later decide to utilize the F^3 or TDP method.

3. A requirement to identify and price all proprietary data, and an option to purchase unlimited data and data rights [Ref. 14:pp. 6-16,22]. This will facilitate any future efforts to transfer technology or initiate component breakout.

4. A requirement to warrant the developed technical data package [Ref. 10:p. 8-2]. This will reduce the risk of inadequate documentation by the contractor.

5. An option to purchase all maintenance items (including data) needed to support the planned maintenance concept for the system [Ref. 14:pp. 6-16,22]. This will allow support and test equipment to also be produced competitively.

C. THE ALTERNATIVE PRODUCTION SOURCING METHOD DECISION

As the program progresses into the D&V phase, technical and business issues emerge that are used by the Program Manager and his acquisition management team to select a methodology for establishing an alternative production source [Ref. 13:p. 5-5]. Issues such as the system maintenance concept, predicted equipment reliability, mission criticality, and procurement costs versus repair costs are significant variables to be used in selecting an appropriate methodology. For example, the requirement for a high degree of organic repair capability requires methodologies other than Form, Fit, and Function. [Ref. 13:p. 5-5]. Business issues such as quantity of production, capacity of the developer, and the contractual complexity, just to name a few, also affect the selection. [Ref. 1:p. 5-7] Two decision models have been developed that provide a consistent and structured approach to selecting an acquisition methodology for establishing alternative production sources. The first model, developed by

Benjamin R. Sellers and Dennis S. Parry [Refs. 15,16], provides a decision matrix comparing characteristics of the acquisition situation to the five second-sourcing methodologies. The second model, developed by the Naval Air Systems Command [Ref. 13], provides a flowchart approach to arriving at the appropriate methodology.

Both methods are considered useful by this researcher. The Program Manager and his acquisition management team, usually consisting of the Business/Financial Manager, the Program/Project Engineer, and the contracting officer at a minimum, will select an appropriate method. It must then be incorporated into the system acquisition strategy in preparation for the Milestone II decision point, as required by DOD and Public Law 98-212. [Refs. 4,8] The exception to this timing is the Contractor Teaming approach, since the nature of this methodology requires its identification by the D&V phase. [Ref. 13:p. 6-3] The contracting strategy must then be further refined or reformulated. It must provide the detailed contracting related strategy that implements the methodology selected. The remainder of this chapter presents the researcher's analysis of techniques for formulating this contracting strategy.

D. CONTRACTING STRATEGY PROGRAM ISSUES

1. Evaluate Program Characteristics and Issues

Every major weapon system acquisition program consists of a unique combination of program issues, characteristics,

requirements, and organizations. Alternative Program Management Organization (PMO) structures include a fully-staffed integrated PMO, a small PMO supported by headquarters functional specialists, and a skeleton PMO supported by field level functional specialists [Ref. 2:p. 2-11]. Each type of organization has different constraints and abilities that depend upon both its structure and the personnel involved. Fully-staffed and integrated PMO's may desire to have more direct control or involvement with the contractors than a small PMO that receives functional support from headquarters personnel in a matrix organization. Additionally, different PMO's develop their own objectives concerning areas such as its access to the potential second source and its control over the technology transfer process. It must also assess potential contractor's cooperation in the technology transfer process. [Ref. 2:pp. 8-6,7] Every major weapon system has its own set of characteristics, including technical complexity, maintenance requirements, and producibility. These could involve issues such as configuration control, Government requirement for technical data and the desire to assume its responsibility, maintainability, supportability, and risk of successful technology transfer. These are just a few of the potential unique program issues and characteristics. Many more are possible, depending upon the program's acquisition situation. The contracting officer can extract these program issues from the acquisition strategy, the Program Manager, and the various

functional strategies. These functional strategies could include plans such as the Test and Evaluation Master Plan, the Integrated Logistics Support Plan, and the Systems Engineering Master Plan. [Ref. 2:p. 4-4] In some instances, the formal functional implementation plans are also in the formulation stages, therefore comprehensive documentation may not be available. In this situation, contracting officers interviewed by the researcher indicated that they utilize various information gathering techniques. The contracting officer attends many program conferences with members of the PMO concerning progress, strategy, and program issues. Periodic conferences are attended with contractor representatives. Information is obtained from correspondence, reports, and other organizations such as contract administration offices. Issues may be obtained from, or provided by higher levels, including headquarters, the Service Secretary's office, and OSD. They are important, since they will significantly influence how the objectives of the acquisition strategy are to be pursued by the PMO and the functional support team. Therefore, the first step in formulating a major weapon system contracting strategy is to consolidate as many program production competition-related issues and characteristics as possible from the various functional strategies/plans, if available, and from all other available sources.

Every major weapon system acquisition program has its own combination of unique program issues and circumstances

that influence the contracting strategy. An exhaustive analysis of every possible program issue and its impact upon contracting strategy formulation is beyond the scope of this research effort. During the course of research, several program issues were consistently encountered that received careful analysis during contracting strategy formulation. These program issues, therefore, will be introduced, and they include:

- Technical Data Issues
- PMO Engagement in Establishing Production Competition
- Risk of Technology Transfer
- Contractor(s) Cooperation/Opposition to Production Competition
- Support for Production Competition

2. Technical Data Issues

Issues surrounding technical data consistently emerge in developing a contracting strategy that will promote the opportunity for, or implement production competition. These issues typically involve the requirement for technical data according to the planned maintenance philosophy for the system [Ref. 13:p. 5-5], the status of the TDP [Ref. 10: p. 5-4], and the existence of proprietary technical data [Ref. 10:p. 5-8].

Every major weapon system has a planned maintenance philosophy. It can emphasize the requirement for system design disclosure, or it can negate the requirement. A

maintenance philosophy that requires only removal and replacement action at the organic level with internal repair at a contractor depot, or for expendable, nonrepairable items, allows the contracting officer to place less emphasis upon technical data issues. A maintenance philosophy that requires repair capability by internal intermediate or depot repair activities necessitates design disclosure to support the repair capability. [Ref. 13:p. 5-5] It also implies that contractors produce identical equipment to support logistical affordability and configuration control requirements. Technical data issues receive much more consideration in this situation. The contracting strategy must define how technical data and processes will be provided to sources other than the system developer in order for them to produce identical equipment.

The contracting officer must consider the status of the TDP in formulating a contracting strategy that will transfer technical data and processes. It is a critical consideration under the TDP approach [Ref. 10:p. 5-4] since the success of achieving production competition depends upon the availability of a complete, accurate, and validated TDP. The status of the TDP for the Phoenix missile program, which had been in production for several years, was a major issue in the formulation of the contracting strategy for that program's second sourcing efforts. [Ref. 17] The Phoenix program contracting officer indicated that following the decision to develop a second source for the missile by TDP, it was learned that only

level two drawings riddled with the developer's unique processes were available. Additionally, the developer was considered to be neither capable nor willing to develop an adequate TDP. The major thrust of the contracting strategy formulation was, therefore, centered around the development of the TDP. Conversely, the availability of an adequate, validated TDP enabled the contracting officer for the HARM missile program to formulate a flexible contracting strategy for second sourcing. [Ref. 18] She stated that following unsuccessful efforts to second source the entire missile, she was able to utilize component breakout and initiate second sourcing for the missile command launch computer (CLC). The contracting officer for the LSD-41 class amphibious ships stated that formulating a contracting strategy to obtain the ship's detailed design package was the cornerstone for procuring five of the eight ships on a competitive basis. [Ref. 19]

The existence of proprietary data can be a significant factor in formulating a contracting strategy for production competition. Early planning and actions taken during the early competitive development phases to identify, price, and negotiate proprietary data agreements can help limit subsequent problems in this area. [Ref. 10:p. 5-8] In situations where the developing contractor does claim to own proprietary data for the system, the contracting officer may formulate a contracting strategy involving a licensing arrangement to establish a second source. [Ref. 20:p. 64] Several programs

have dealt with proprietary data via the licensing approach. Among these are the Joint Cruise Missile Engine program, the Reference Measuring Unit and Computer/Inertial Navigation Element for the Cruise Missile, the Very High Speed Integrated Circuit program, and the Harrier Aircraft program. [Ref. 20: p. 6] These programs indicate that given the presence of proprietary data and the decision to develop alternative production sources via licensing, the contracting strategy formulation process focuses upon issues such as:

- Determination of royalty fees
- Licensee selection
- Developer motivation for licensing
- Licensee qualification

3. Risk of Technology Transfer

Closely related to the issue of technical data is the issue of technology transfer risk. Risk management is one of the primary responsibilities of the PM and his supporting acquisition team, which includes the contracting officer. [Ref. 2:p. 4-44] Most methodologies for establishing production competition involve the transfer of technical data and/or manufacturing processes from the system developer to the potential alternative production source(s). Duplicative production by sources other than the developer depends upon the successful transfer of the required technology, i.e., successful management of technology transfer risk. The Phoenix

missile contracting officer stated that the unavailability of an adequate TDP for a missile that has been in production for several years greatly increased the risk of technology transfer in the Phoenix second sourcing effort, particularly since the second sourcing methodology is by TDP. One of the generic features of the Contractor Teaming second sourcing methodology is that technology transfer is the responsibility of the two team members, therefore problems should be minimized. [Ref. 10:p. 5-6] The contracting officer for the Airborne Self-Protection Jammer (ASPJ) program stated, however, that technology transfer had become a significant problem in that program. [Ref. 21] The Government had not forced technology transfer in the development efforts of the two contractors since they had formed a joint venture. The Government, not a part of the joint venture, had not required demonstration of technology transfer between the two contractors due to cost and schedule tradeoffs, according to the contracting officer. The program is now getting ready to transition to limited production, and lack of technology transfer between the two contractors is a major issue in the contracting strategy for the limited production. In the Navy Extra-High Frequency Satellite Communication (EHF SATCOM) program, the acquisition strategy has enumerated production competition throughout the program. [Ref. 22] The program is characterized by parallel development by two contractors through the FSD phase for design competition for a billion dollar, five year Multi-Year Procurement (MYP).

The contracting officer stated that eventual technology transfer was an early program issue, and a provision was included in the competitive FSD solicitation for the Government to obtain unlimited rights to technical data and validation and verification of technical data which allows Government access to all processes and applications of technical data. [Ref. 22] Programs, such as the HARM missile, that possess a validated TDP, also possess the classic technology transfer risk reduction tool. In the HARM program, the contracting officer stated that the potential second source in possession of the Government provided CLC TDP, had proposed a seventy thousand dollar reduction in the previous sole source CLC production price and was in the process of production qualification at the time of the interview. The contracting officer for the LSD-41 class ships stated that the availability of a proven detailed design package, developed during construction of the lead and second ship, enabled the subsequent competition for the next annual requirement to result in a savings of almost four hundred million dollars. [Ref. 19]

4. Program Management Office Engagement in Establishing Production Competition

The contracting officer must be sensitive to the amount of PMO involvement in the process of establishing alternative production sources while formulating the contracting strategy. While the various methodologies for establishing alternative production sources have generic attributes concerning the

amount of PMO involvement, the contracting officer must also consider the realities of the specific program in formulating the contracting strategy. Illustrations of this include the Phoenix missile program and the ASPJ program. In the Phoenix program, which utilized the TDP approach, generically the PMO would experience extensive involvement in the process in the areas concerning the contents of the TDP, the amount of developer support required, the second source selection, the TDP validation and transfer, and the second source qualification. [Ref. 10:p. 10-1] The Phoenix PMO, however, decided that it was in the best interest of the Government that PMO involvement be limited in the areas of validation of and liability for the subsequently developed TDP. The contracting officer had to accommodate this PMO engagement issue while formulating the contracting strategy. In the ASPJ program, the generic nature of the Contractor Teaming approach places much of the administrative burden on the contractors, thus limiting PMO administrative involvement. [Ref. 10:p. 13-5] The ASPJ contracting officer indicated that the PMO's previous practice of limited involvement with the contractors in the joint venture allowed the contractors to minimize their cooperation and technology transfer. [Ref. 21] This, in fact, has resulted in a much heavier burden upon the PMO, as reflected in the present contracting strategy that is attempting to restore and accelerate the technology transfer process. PMO involvement in the SURTASS program shifted direction two times.

[Ref. 23] Following competition for FSD, the system developer was unable to satisfactorily develop the towed array subsystem in 1981. Another contractor offered an array to the Navy for consideration which did work satisfactorily. The Navy broke the towed array subsystem out and bought it from the other contractor as GFE to the system developer. In late 1983, the PMO decided to second source the towed array under the Form, Fit, and Function technique. The contracting officer stated that PMO involvement was a factor in contracting strategy tradeoff decisions, first to break the towed array out rather than to continue development by the system developer. [Ref. 23] In the second sourcing decision, the contracting officer stated that a Form, Fit, and Function type contracting strategy was adopted since the PMO did not have the resources to obtain technical data or to motivate the array developer to participate in a second sourcing effort. In the Leader-Follower second sourcing methodology, the amount of PMO involvement is a primary concern in the decision as to the contractual relationship implemented. Under the approach of a Leader-Follower subcontract relationship, the Leader is responsible for technology transfer, source selection, and for the Follower's initial deliveries. The administrative burden upon the PMO is thereby lessened. [Ref. 10:p. 11-3] Under the approach where both Leader and Follower are awarded prime contracts, PMO involvement is substantially greater, since the Government is responsible for coordination for Follower selection and qualification. It

is also responsible for coordination of a technology transfer arrangement between the Leader and Follower. Increased PMO staffing may be required to monitor two contractors and for additional technical support to manage the technology transfer effort. [Ref. 10:pp. 11-4,5]

5. Contractor(s) Cooperation/Opposition to Production Competition

Contractors have not historically demonstrated an unqualified willingness to participate in the Government's efforts to establish production competition. The researcher observed that in almost every program in which the Government has endeavored to establish production competition, the contractor's participation was obtained under the contractually imposed pressures of competition. Contractual incentives were sometimes utilized to ensure continued participation. In cases where contractor opposition was encountered, contracting strategies employed techniques such as tying participation provisions to existing contracts, as in the Phoenix missile program, or by issuing a F^3 RFP in spite of the developer's opposition, as in the Joint Cruise Missile Engine Program and the Navy's Towed Array program. Even while participating in the production competition effort, contractors will endeavor to advance their own position at the expense of competitors. Contracting strategies must be formulated that limit the impact of contractor's resistance. In the Phoenix missile program, the contracting officer stated that the developer was kept

divorced from the potential second sources to preclude developer negative influence upon the production competition effort. [Ref. 17] In the Navy EHF SATCOM program, an economic price adjustment (EPA) clause was included in the solicitation for the FSD estimate to complete and the priced production option. Thi clause was intended to cover real escalation over five percent during this five year MYP. The contracting officer knew that one of the competing contractors would propose at least five percent lower than normal to win the award knowing that if inflation exceeded five percent, they would invoke the EPA provision which would, in effect, approximate their original objective. The other contractor, knowing this probable strategy, would be forced to propose more conservatively.

6. Support for Production Competition

The contracting officer should be aware of the level of support for establishing production competition in a particular program. This encompasses the position of key officials within the military service, other services, OSD, Congress and industry. Actions and decisions that provide either support or lack of support for the establishment of alternative production sources can significantly impact formulation of the contracting strategy. The contracting officer for the ASPJ program stated that the ASPJ has always been a high visibility program in that it was one of the first programs to utilize the Contractor Teaming joint venture approach. [Ref. 21] Additionally, the ASPJ was advertised as the all-purpose, multi-service

airborne electronic countermeasures equipment, although other similar equipment was also in production. ASPJ development problems resulted in funding and schedule difficulties. Political support for the program eroded, further aggravating the funding situation. Finally, the Office of the Secretary of the Navy directed a major change in the program's acquisition strategy to retain the joint venture through the low-rate initial production (LRIP) subphase. The contracting officer stated that this caused a tremendous impact upon the contracting strategy formulation for production. [Ref. 21] In the HARM program, the contracting officer indicated that the original efforts to second source the missile were supported by the Navy, but not the Air Force, and they had the majority of the outyear quantities. [Ref. 18] After the SECDEF decision not to second source the missile, the contracting officer was still able to fall back to component breakout and second source the command launch computer. In the Navy EHF SATCOM program, the contracting officer stated that lack of support resulted in funding cuts. Additionally, one of the competing contractors was in danger of leaving the competition because of development and funding problems. These facts made it clear to the PMO and the contracting officer that the program would probably not reach Technical Evaluation (TECHEVAL) in a competitive environment. The contracting strategy was revised to issue an RFP to both contractors for an FSD estimate to complete and also for priced production options. In this

way, if one contractor does not make it, the initial production prices will have been obtained under the pressures of competition.

E. THE CONTRACTING STRATEGY ISSUE IDENTIFIER MODEL

1. Analysis of Program Issues

The contracting officer must proactively identify program issues that may require special emphasis or treatment in the contracting strategy and ultimately in the contract itself. In order to do this, he can analyze the selected acquisition strategy methodology for establishing alternative production sources in relation to the list of program issues presented in Section D of this chapter. By analyzing the suitability of the alternative production sourcing methodology for accomplishing or accommodating the listed program issues, the contracting officer can identify those program issues that are easily accommodated by the selected method, those that are possible but very difficult to accomplish, those that appear to be in conflict with the method and those that are not affected at all. This procedure is illustrated by Figure 4.1.

In using this Contracting Strategy Issue Identifier Model (CSIIM), a "+" indicates that the alternative production sourcing method is well suited to accommodate or accomplish the specified program issue. An "x" indicates that the program issue is possible but very difficult to accomplish under the

CONTRACTING STRATEGY ISSUE IDENTIFIER MODEL

PROGRAM ISSUE	F^3	TDP	LF 1	LF 2	DL	CT	CB	DC
TECHNICAL DATA ISSUES								
Military Service Maintenance Required	X	+	+	+	+	+	X	+
Validated TDP Unavailable	0	X	+	+	0	0	X	0
Proprietary Data Exists	0	-	-	-	+	-	-	0
TECHNOLOGY TRANSFER RISK REDUCTION	0	+	+	X	+	+	X	0
PMO ENGAGEMENT IN ESTABLISHING PRODUCTION COMPETITION								
High	+	+	+	+	+	+	+	+
Limited	-	-	+	-	+	X	X	-
CONTRACTOR(S) COOPERATION/ OPPOSITION TO PRODUCTION COMPETITION								
Contractor-to-Contractor Cooperation Required/ Promoted	0	0	+	X	+	+	X	0
Limit Developer Opposition	+	+	X	X	X	X	X	+
SUPPORT FOR PRODUCTION COMPETITION								
High	+	+	+	+	+	+	+	+
Low	X	X	X	X	X	X	X	X

LEGEND:

+ Suitable for Accomplishment
- Unsuitable for Accomplishment
X Very Difficult to Accomplish
0 Neutral Impact

LF1 - Leader Subcontract to Follower
LF2 - Both Leader, Follower Primes
F^3 - Form, Fit, Function
TDP - Technical Data Package
LF - Leader-Follower
DL - Directed Licensing
CT - Contractor Teaming
CB - Component Breakout
DC - Design Competition

Source: Developed by the Researcher

Figure 4.1

the selected method. A "-" indicates that the selected method is unsuited to accommodate the program issue. A "0" indicates a neutral impact. It should be noted that the program issue weightings are not additive. Each program issue is to be considered independently for the particular methodology. Analysis of the program issues as they are typically accommodated by the generic nature of the methodologies for establishing production competition supports the weightings assigned in the CSIIM.

2. Technical Data Issues Analysis

Systems which have a planned maintenance philosophy that requires military service repair capability at the organic, intermediate and/or depot levels, and that require functionally and logistically interchangeable configurations can be suitably accomplished by all the detailed design disclosure production competition methodologies [Ref. 13:p. 5-2]. Conducting design competition (DC) for production would also support the maintenance requirement since the detailed design is the basis upon which the competition is held. The F^3 methodology may be difficult to implement in this area, since it is not concerned with the internal design of the equipment. The system must only meet performance specifications and meet size, power, weight, cooling, and interface requirements. While very difficult, the F^3 methodology has been used to establish production competition and supported the maintenance requirement. In the Alternate Fighter Engine program, the

maintenance support equipment and facilities were made adaptable to both configurations and the maintenance personnel were also trained for both. [Ref. 10:p. 9-6]

The unavailability of a validated TDP is not a factor in the Directed Licensing, Contractor Teaming, and Design Competition approaches. Under these approaches, the development of the TDP is one of the purposes of the methdology, the developer licenses the second source to use proprietary data, or the systems are already developed. Data availability is not an issue in the F^3 method. The Leader-Follower method is suited for establishing production competition without a validated data package since technology transfer is achieved through direct technical assistance from the developer (Leader) to the second source (Follower) either through a subcontract relationship or through an engineering support service contract with the Leader when the Follower is also a prime contractor. [Ref. 10:p. 11-1] Since the validated TDP is the primary basis for technology transfer under the TDP approach, TDP unavailability can cause major difficulties. Those difficulties can only be overcome by efforts to develop a validated TDP. Techniques have been developed for validating the available data through joint industry-Government validation, Government independent validation, and validation through provision of available data, a performance specification, and a current model of the system. [Ref. 13:pp. 6-5,9] Component breakout efforts may encounter

the same difficulties as the TDP approach in developing alternate suppliers.

Directed Licensing is the only method specifically adapted to transfer proprietary data. F^3 and Design Competition are not affected, since technical data does not influence the ability to conduct production competition. The existence of proprietary data precludes the use of the other methodologies, since they depend upon voluntary, uncompensated transfer of technology.

3. Risk of Technology Transfer Analysis

Technology transfer does not occur in the F^3 and Design Competition, thus, no impact. The TDP method is suited to reducing the risk of technology transfer, since the stand-alone TDP should enable second sources to translate it to their own processes. The Directed Licensing approach has as a primary characteristic that technology transfer is the responsibility of the Licensor. Technology transfer risk is reduced under the Contractor Teaming approach since the system is under joint development and both contractors will have to demonstrate production capability for the entire system. The Leader-Follower approach, where the Leader subcontracts with the Follower, is suited to technology transfer risk reduction, since the Leader is responsible contractually for Follower production qualification and its initial deliveries. [Ref. 10:p. 11-3] In the Leader-Follower approach, where both the Leader and Follower have prime contracts, it may prove difficult

to accomplish technology transfer risk reduction. The Follower may be unacceptable to the Leader, the technology transfer agreement may not be adequate, and there is no direct linkage between the Leader and Follower. [Ref. 10:pp. 11-4,8] Component Breakout techniques can experience the same advantages and difficulties as the method utilized to effect the technology transfer.

4. Program Management Office Engagement in Establishing Production Competition Analysis

If the PMO has both the resources and the objective of a high degree of engagement in the process of establishing production competition, any of the methodologies are suitable. Difficulties arise when the PMO, due to resource and/or objective constraints, desires to limit its involvement in the process. Methods that require a high degree of PMO involvement for functions such as source selection, source qualification, contract monitoring, data package validation, equipment certification, and other activities associated with prime contracts may not be suited for low PMO involvement. These include F^3, TDP, Leader-Follower (both prime contractors), and Design Competition. Component Breakout may be difficult to accomplish with limited PMO involvement if a new source for the component must be developed by the Government under a prime contract characterized by the aforementioned methods. Although the inherent nature of the Contractor Teaming method limits the administrative burden of the PMO, it is still a very

complicated endeavor. [Ref. 10:p. 13-1] Problems will certainly emerge over time that will place increasing burdens upon PMO resources. The generic nature of the Leader-Follower (Leader subcontracts with the Follower) and the Directed Licensing approaches enable them to accommodate low PMO engagement. Under these two approaches, the Leader and the Licensor are contractually responsible for the progress, technology transfer, and deliveries of initial production from the respective Follower and Licensee.

5. Contractor(s) Cooperation/Opposition to Production Competition Analysis

Contractor-to-contractor cooperation is not required under the F^3, TDP, and Design Competition approaches. The Leader-Follower (Leader subcontracts with the Follower), Directed Licensing, and Contractor Teaming approaches have all been characterized as methods that enhance the cooperation between the contractors, particularly when the contractors have participated in the responsibility for selection of the second source. The Leader-Follower (both prime contractors) approach may encounter cooperation difficulties, since there is no direct linkage between the contractors. Additionally, if the Leader did not participate in the Follower selection, he may be reluctant to cooperate with the Follower. Contractor cooperation difficulties could arise in a component breakout effort as well, depending upon source availability and the technology transfer methodology employed.

Any methodology for establishing production competition that experiences aggressive developer opposition will have difficulties. F^3, TDP, and Design Competition have the best chance for success in that they may be employed independent of the developer, thus minimizing the impact of his opposition. All the other methodologies will experience difficulties in proportion to the degree of contractor-to-contractor coqperation required and the level of control or influence exercised by the developer over the second source.

6. Support for Production Competition Analysis

Programs with a high level of support have a much greater chance for success than those that experience erosion of support. This is easily stated, however, the contracting strategy must often provide the vehicle for progress where support is lacking with subsequent program instability. Any erosion of program support can indicate the need for immediate contingency planning.

The program issues that result in a "X" or a "-" are areas where potential contracting difficulties may be encountered. The contracting officer can thus proactively formulate a contracting strategy that best accommodates the identified issues in the CSIIM. This may be accomplished by emphasizing the issue in the source selection criteria, by inclusion of special clauses or provisions in the solicitation, or by development of contractual incentives.

F. SUMMARY

This chapter has presented the contracting strategy as a tool that can make a significant contribution to creating a positive foundation for future production competition.

Even though the system is not well-defined during the Concept Exploration phase, contractual provisions in the areas of performance specifications, data/data rights, and maintenance items in the Demonstration and Validation phase solicitation can hold open the future opportunity for production competition.

During the Demonstration and Validation phase, as the system becomes more defined, preparation for the Milestone II decision point must include the program decision concerning which methodology to employ to establish an alternative production source. Two decision models were identified that can provide assistance to the Program Manager and his acquisition management team in that decision process.

Given an alternative production sourcing methodology, the contracting officer must formulate a detailed functional contracting strategy through which to implement it. A technique was analyzed by the researcher through which the contracting officer evaluates program issues which the research consistently encountered in contracting strategy formulation in relation to the selected alternative production sourcing method to determine its suitability and/or to identify potential contracting problem areas in accommodating the program issues.

The contracting officer then formulates a tailored contracting strategy that addresses the potential problem areas identified in the CSIIM. Contractual methods such as source selection criteria emphasis, special clauses or provisions, incentives, or other applicable procedures may be utilized. The resultant contracting strategy reflects a proactive effort by the contracting officer to accumulate multi-functional program issues, evaluate them in relation to acquisition strategy objectives, identify potential barriers to production competition, and to formulate a contractual strategy that will eliminate those barriers.

V. CONTRACTING STRATEGY ISSUE IDENTIFIER MODEL UTILIZATION

A. INTRODUCTION

The purpose of this chapter is to illustrate and analyze the use of the Contracting Strategy Issue Identifier Model (CSIIM) in formulating a contracting strategy for production competition in major weapon systems acquisition. Two actual programs will be presented for application of the CSIIM; the Navy's Phoenix missile program, and the Navy-led, Extra-High Frequency Satellite Communication (EHF SATCOM) program. For each program, the general situation will be presented as related to the researcher by PMO personnel and the program contracting officer. Next, the program issues that the research identified as consistently requiring consideration in contracting strategy formulation will be discussed as they relate to the specific program. Finally, for each program, the CSIIM will be applied to the programs and analyzed against the actual contracting officer's contracting strategy.

B. THE PHOENIX MISSILE PROGRAM

1. General

The Navy's Phoenix missile program has been in production for several years. According to the PMO, the system had not demonstrated the level of performance and quality desired, and the following trends had been observed:

- The developer's costs were not progressing down a learning curve anywhere near the expected rate.

- Even though the system has been in production for several years, quality and performance problems have necessitated continued system development.

- This continued development effort by the developer appeared excessively slow.

- A technical baseline and configuration control was virtually non-existent, and a change rate of two hundred percent had been experienced. The Government has been buying the missile under performance specifications.

- The developer had been very unresponsive to the PMO's efforts to accelerate development, improve efficiency and performance, and to establish a firm technical baseline.

In mid-1984, the decision was made, despite the PMO's reluctance, to develop a second source for the missile. The developer expressed immediate opposition. The Leader-Follower and Licensing methods were rejected due to the developer's opposition and the PMO's lack of confidence in the developer's ability to transfuse technology. The F^3 method was rejected due to the complexity of the missile and logistics considerations. The TDP approach was selected as the methodology for establishing a second source for the missile.

2. Technical Data Issues

A complete, level three technical data package for the missile was unavailable. The contracting officer stated that a key Government shortcoming in the missile development was that the Government failed to specify the requirement for a level three data package. He also stated that the Government

failed to monitor the development of a data package and did not enforce data submission requirements. The result was an incomplete level two data package that was riddled with the developer's unique legends and processes. There was no strategy in existence for the establishment of a technical baseline or for either Government or industry configuration control. The PMO did not consider the Government to be in a position to require the developer to produce an adequate TDP and, in fact, the PMO questioned the developer's ability to do it.

3. Technology Transfer Risk

Technology transfer risk was significant. The developer opposed the idea of second sourcing the missile and was, therefore, unwilling to give up technology. The PMO also questioned the developer's ability to transfer technology even if it desired to do so. Further increasing the risk was the selection of the TDP approach without not only possession of, but also the existence of an adequate, validated TDP.

4. Program Management Office Engagement in Establishing Production Competition

The PMO appeared willing and able to expend the necessary involvement to achieve establishment of the second source. They did, however, express the intention to limit PMO involvement in the areas of TDP validation and the resulting liability for the TDP.

5. Contractor(s) Cooperation/Opposition to Production Competition

The PMO indicated that they desired to divorce the developer from the potential second sources as much as possible. They did not want the developer to exercise any control or to project a negative influence over the process. The PMO did recognize the fact that some developer engineering assistance would be necessary due to the status of the technical data package. Both the PMO and the contracting officer felt that this would limit the impact of the developer's opposition to the second sourcing effort.

6. Support for Production Competition

Support for the second sourcing effort was present within the Navy, however, this was not reflected in the funding level. The Navy Secretariat, in fact, was about to reduce the funding level for the program due to the anticipated forces of competition. The contracting officer expressed the opinion that since the program was directed to second source the missile and the appropriate funding was not available, the break-even point for the competition would be far in the future. He expected resistence, therefore, at the OSD and Congressional levels. Additionally, he stated that industry was skeptical about such effort when they did not see funding in the appropriation bills.

C. APPLICATION OF THE MODEL TO THE PHOENIX MISSILE PROGRAM

1. The Contracting Strategy Issue Identifier Model and Technical Data Package

The Phoenix missile program office utilized the TDP approach to establish a second source for the missile. The TDP portion of the generic CSIIM is extracted to produce a TDP CSIIM as presented in Figure 5.1.

Utilizing the generic TDP CSIIM as a tool to identify program issues that will require special emphasis or cause potential problems in contracting strategy formulation for the Phoenix missile, the contracting officer could surmise the following:

- Emphasis and attention must be provided in the area of technical data, more specifically concerning the status of the TDP. This is a fundamental weakness and must be accommodated in order to effectively pursue the TDP approach. Problems should not be encountered in the area of maintenance philosophy. If a proprietary data issue emerges, the TDP approach would not be suitable.

- The risk in achieving technology transfer should be suitably reduced under the generic TDP approach.

- As the amount of the PMO involvement in the TDP process is increasingly limited, the degree of emphasis in the contracting strategy will increase.

- Contractor(s) cooperation is not a factor, and the TDP approach acceptably limits the impact of the developer's opposition to the effort.

- The degree of support for the second sourcing effort must be assessed to determine the impact upon contracting strategy formulation. Anything but a high level of support indicates required attention and/or contingency planning.

TECHNICAL DATA PACKAGE AND THE CONTRACTING STRATEGY ISSUE IDENTIFIER MODEL

PROGRAM ISSUE	TDP
TECHNICAL DATA ISSUES	
Military Service Maintenance Required	+
Validated TDP Unavailable	X
Proprietary Data Exists	-
TECHNOLOGY TRANSFER RISK REDUCTION	+
PMO ENGAGEMENT IN ESTABLISHING PRODUCTION COMPETITION	
High	+
Limited	-
CONTRACTOR(S) COOPERATION/OPPOSITION TO PRODUCTION COMPETITION	
Contractor-to-Contractor Cooperation Required/Promoted	0
Limit Developer Opposition	+
SUPPORT FOR PRODUCTION COMPETITION	
High	+
Low	X

LEGEND:
+ Suitable for Accomplishment
- Unsuitable for Accomplishment
X Very Difficult to Accomplish
0 Neutral Impact

Source: Developed by the Researcher

Figure 5.1

2. Phoenix Missile Program Contracting Strategy

The actual contracting strategy for establishing alternative production sources for the Phoenix missile did focus upon the program issues identified in the TDP CSIIM that should receive special emphasis, i.e., the unvalidated data package, PMO desire to limit its involvement in the subsequent data package validation and the liability for it, and an awareness of the political attitudes surrounding the effort. [Ref. 17]

In the area concerning the unvalidated data package, which was the main thrust of the contracting strategy, a reprocurement data package will be developed by the two potential second sources utilizing available data and a missile provided by the Government. The resulting TDP will be presented by the potential second sources in the form of a proposal. The Government will select the most promising proposal for possible subsequent production qualification.

Technology transfer risk reduction was not an issue identified in the TDP CSIIM for emphasis in contracting strategy formulation. It should be noted that the TDP CSIIM reflects the generic attributes of the TDP approach, which assumes that a validated TDP is available. Technology transfer is accomplished at low risk through the validated TDP. In the Phoenix program, however, this was not possible due to the state of the data. The contracting strategy accommodated the issue by utilizing the engineering and design capabilities of two

potential second sources to develop the TDP, thus enhancing the chance of successful TDP development.

The contracting strategy accommodated the PMO objective of limited involvement in the TDP validation by including a provision that would require the system developer to actually produce the missile in its plant according to the TDP developed by the potential second source. In order to limit the Government's liability, the contracting strategy called for the TDP proposal to be called a Certified Technical Baseline by the potential second sources. The TDP CSIIM also identifies limited PMO involvement as a program issue of concern to the contracting strategy.

The generic TDP CSIIM indicates that contractor-to-contractor cooperation has no impact, since under the generic TDP approach, the availability of a validated TDP eliminates the need for contractor-to-contractor interaction. The Phoenix contracting strategy did, in fact, maintain contractor separation by forming a Government liaison team to perform communication and resolve contractor's technical questions. The impact of the developer's opposition to the second sourcing effort was limited by the TDP approach, by divorcing it from the potential second sources. Any involvement required of the developer was tied to its current production contract, and the engineering support services were delivered to the Government, not to a potential competitor.

The contracting officer stated that based upon the mixed level of support anticipated for the Phoenix second

sourcing effort, he was about to coordinate with PMO personnel in efforts to identify future options for maintaining the production quantity and also to accelerate the anticipated break-even point.

The researcher concludes that the TDP CSIIM does identify program issues that the contracting officer had to formulate innovative contracting techniques to accommodate. The unusual situation where the TDP approach was employed without the availability of a validated TDP accounts for the variation in the technology transfer risk and contractor(s) cooperation program issues.

D. THE EXTRA-HIGH FREQUENCY SATELLITE COMMUNICATION PROGRAM

1. General

The Extra-High Frequency Satellite Communication (EHF SATCOM) program is a Navy-led program to procure MILSTAR satellite compatible communication terminals for all the military services. It is a billion dollar program that will pursue a five year MYP contract, if Congress approves the request. The acquisition strategy has enumerated production competition as an objective since program initiation. In that a MYP is anticipated, the methodology employed for production competition has been parallel development through the FSD phase for design competition for the MYP production award. FSD runs through the year 1987. The program had been running satisfactorily until a combination of funding cuts and slower than

expected technical progress by one of the competing contractors made it clear that the program would not be able to reach TECHEVAL with both contractors competing. The decision was made to revise the acquisition strategy and conduct production competition during FSD. At the time of the interview with the contracting officer, a solicitation had been issued to the two contractors requesting an estimate to complete for FSD and priced production options. [Ref. 22]

2. Technical Data Issues

Availability of a validated TDP and proprietary data were not issues in the program. The Government had provisions in the FSD contract for unlimited rights to all technical data and had a validation and verification provision, which allows the Government access to the contractor's manufacturing processes, applications, and data. A maintenance philosophy requiring military service maintenance capability is also supported under this detailed design disclosure methodology.

3. Risk of Technology Transfer

Technology transfer is not an issue in the EHF SATCOM program, since it is utilizing parallel and separate development through FSD for design competition for a MYP production award.

4. Program Management Office Engagement in Establishing Production Competition

The contracting officer stated that the PMO had not indicated, either through meetings or documentation, any desire or reason to limit its involvement in the design

competition process. A high degree of PMO involvement, is therefore, concluded.

5. Contractor(s) Cooperation/Opposition to Prcduction Competition

Under the separate and parallel development approach, contractor-to-contractor cooperation is neither required nor desired. Neither contractor had exhibited any actions that would oppose the effort for production competition.

6. Support for Production Competition

Support for the production competition effort was perceived, however this support did not extend to the program funding. Funding levels had been reduced and was a major factor in the decision to conduct the competition for the producing contractor during FSD.

E. APPLICATION OF THE MODEL TO THE EXTRA-HIGH FREQUENCY SATELLITE COMMUNICATION PROGRAM

1. The Contracting Strategy Issue Identifier Model and Design Competition for Production Competition

The EHF SATCOM program utilized the Design Competition approach to establish production competition for the satellite communication terminals. The Design Competition portion of the generic CSIIM is extracted to produce a Design Competition CSIIM as in Figure 5.2.

Utilizing the generic Design Competition CSIIM as a tool to identify program issues that will require special emphasis or cause potential problems in contracting strategy

DESIGN COMPTETION AND THE CONTRACTING STRATEGY ISSUE
IDENTIFIED MODEL

PROGRAM ISSUE	DC
TECHNICAL DATA ISSUES	
Military Service Maintenance Required	+
Validated TDP Unavailable	0
Proprietary Data Exists	0
TECHNOLOGY TRANSFER RISK REDUCTION	0
PMO ENGAGEMENT IN ESTABLISHING PRODUCTION COMPETITION	
High	+
Limited	-
CONTRACTOR(S) COOPERATION/OPPOSITION TO PRODUCTION COMPETITION	
Contractor-to-Contractor Cooperation Required/Promoted	0
Limit Developer Opposition	+
SUPPORT FOR PRODUCTION COMPETITION	
High	+
Low	X

LEGEND:
+ Suitable for Accomplishment
- Unsuitable for Accomplishment
X Very Difficult to Accomplish
0 Neutral Impact

Source: Developed by the Researcher

Figure 5.2

formulation, the EHF SATCOM contracting officer could surmise the following:

- All the technical data issues are either suitably accommodated or not an issue due to the generic nature of the Design Competition approach.

- Technology transfer is not a factor when contractors compete designs in separate and parallel development through FSD.

- A high level of PMO involvement is required due to the responsibilities it must cover in managing at least two separate contracts. Limiting PMO involvement would jeopardize the effectiveness of the approach.

- Separate parallel development for design competition eliminates the requirement for contractor(s) cooperation or interaction. Contractors opposed to the design competition would most probably not enter the process. Separate parallel development limits the impact of any contractor's opposition to the process.

- A high level of support for the process enhances its probability for success. As support erodes, the negative impact requires that the contracting strategy be formulated so as to obtain as many benefits from competition as possible while the competitive environment exists.

2. The Extra-High Frequency Satellite Communication Program Contracting Strategy

The actual contracting strategy for the EHF SATCOM program that was formulated as a result of the acquisition strategy revision in FSD did react to the issue of low program support that is identified in the Design Competition CSIIM. All other program issues in the contracting strategy followed the generic nature of the Design Competition approach and did not receive noteworthy attention. The PMO's involvement was not limited, therefore, that issue did not apply. [Ref. 22]

As a result of the erosion of program support, reduced funding, and lack of performance by one of the competing contractors, the decision was made to conduct the competition to select the producer during FSD. The solicitation was worded in such a way that, while not biased toward either contractor, it took advantage of the two contractors well-known proposal pricing practices (one historically low, the other historically expensive). Therefore, the production prices would be obtained under competitive pressures and no matter which contractor won the competition, a price baseline had been established. The contracting strategy thus obtained as many benefits of competition as possible while the competitive environment existed.

The researcher concludes that while the Design Competition CSIIM did not identify a number of problem program issues for contracting strategy formulation, a number of problem program issues did not, in fact, exist. It did reflect the impact of low program support.

F. SUMMARY

This chapter has presented the utilization of the CSIIM by application and analysis of the technique in two actual major weapon systems acquisition programs. The results of the application and analysis of the CSIIM utility indicate that it is a useful tool in analyzing those program issues that this research has identified that most consistently emerge in

contracting strategy formulation. It also demonstrated that unique program characteristics may develop program issues that are uncharacteristic of the selected generic methodology for establishing production competition. In these instances, the CSIIM must receive additional analysis beyond the generic attributes displayed in the model.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The following conclusions were developed as a result of this research effort.

The contracting strategy is critical in implementing a major weapon system acquisition strategy, however, there is no formal guidance for preparation of or a requirement for a separate contracting strategy document (plan).

As discussed in Chapter II, the contracting strategy is a subset of the Business/Financial functional implementation plan that addresses the contractually-related program issues. In order for the contract to ultimately cover all the objectives and requirements included in the other functional implementation plans, the contracting strategy must serve to integrate those objectives and requirements into the acquisition plan.

The role of the contracting officer in acquisition strategy development and implementation is not uniform in major weapon systems acquisition.

Since there is no formal recognition of the contracting strategy and its role in integrating program requirements and objectives, the contracting officer has no established means to uniformly formulate a contracting strategy and an acquisition plan. The contracting officer's participation in acquisition plan development, in fact, varies from program-to-program.

In some instances, the contracting officer is responsible for its development, while in others, the contracting officer provides an input to the Program Manager.

Establishing production competition in programs already in production requires the same planning and actions as required when production competition is pursued during the pre-production phases.

The complexity and expense of today's major weapon systems do not lend themselves to impulsive or under-planned initiation of production competition. Careful planning and actions that will accommodate issues such as technology transfer, required resources, program support and political attitudes, schedules, and industry availability/interest must be accomplished in order to effectively achieve production competition. Actions initiated in earlier acquisition phases may take advantage of more available options and longer time to accomplish logical planning. Once a program is in the production phase options are limited, time is a constraint, and the benefits of competition are more vague.

Decisions involving production competition are frequently made at levels above both the contracting officer and the Program Manager.

Programs discussed in Chapters IV and V illustrate the frequency and impact of decisions made by these levels upon the available options for establishing production competition.

Contracting officers must be consistently sensitive to emerging higher level attitudes.

Program issues concerning technical data, risk of technology transfer, PMO engagement in establishing production competition, contractor cooperation/opposition to production competition, and support for production competition exist that are consistently encountered and must be considered by the contracting officer during contracting strategy formulation.

As presented in Chapter IV, this research effort consistently encountered the program issues of technical data, technology transfer risk reduction, PMO engagement in establishing production competition, contractor(s) cooperation/opposition to production competition, and support for production competition. Careful analysis of these issues in relation to the methodology employed for establishing production competition, by a technique such as the CSIIM, can assist the contracting officer in identifying areas of special concern in contracting strategy formulation.

It is possible to model major issues involved in production competition in relation to the principal second sourcing acquisition methodologies.

Chapter IV presented the program issues consistently encountered by this research effort during contracting strategy formulation and a discussion relating them to the feasible methodologies for establishing production competition. A model was then developed to depict the feasible methodologies'

suitability for accomplishing or accommodating the program issues. This model can be used to identify those consistently encountered program issues that will require careful analysis during contracting strategy formulation.

B. RECOMMENDATIONS

The following recommendations are relevant from this research effort.

The contracting officer's role in the integration of the various functional implementation plans should be formally recognized.

The FAR and Service implementing directives and instructions should be revised to give the contracting officer formal recognition and authority for being the focal point for integration of program objectives and requirements into acquisition plans. The responsibility of the PM would not be diminished, since the PM is still responsible for the development of the various functional strategies/plans. Once developed, the contracting officer should be recognized as the integrator.

The contracting strategy should be recognized separately from the Business/Financial strategy/plan.

The researcher recognizes the interrelationship between the two, however, the criticality of the contracting strategy justifies separation. Contracting strategy issues become overshadowed and diluted by budgetary considerations when the Business/Financial Plan contains both areas. The FAR, DOD

FAR Supplement, and Service directives and instructions should be revised to separate the two, and to require a formally prepared and approved Contracting Plan. In this manner, contracting strategy issues will be considered proactively.

The Contracting Strategy Issue Identifier Model should be used in formulating contracting strategies and in evaluating the feasible methodologies for establishing production competition.

The model should be used early in the acquisition cycle for major weapon systems acquisition to formulate the initial contracting strategy for establishing production competition. It should be thereafter evaluated on a consistent basis in relation to program changes and any generic variations to the selected methodology for establishing production competition.

The methodology for contracting strategy formulation through utilization of the Constracting Strategy Issue Identifier Model technique, as set forth in this thesis, should be tested and evaluated.

The technique presented in Chapter IV provides a potential management tool for use by the contracting officer during contracting strategy formulation. The utility of this model should be further explored.

C. ANSWERS TO THE RESEARCH QUESTIONS

1. What is a contracting strategy, and what is the contracting officer's role in a major weapon system acquisition?

The contracting strategy is the procurement portion of the Business/Financial functional strategy. It provides immediate detailed approaches to acquisition strategy contractually-related resource concerns. The acquisition strategy provides the conceptual framework for program execution throughout the program's life. Each procurement action during the program requires an acquisition plan that implements the program objectives within the acquisition strategy framework. The acquisition plan is developed by integrating the various functional implementation plans that detail the specific actions for the instant procurement action. The contracting strategy performs this integration by translating the various functional implementation plan's objectives and requirements into the elements that will ultimately be included in a contract solicitation.

2. What are the principal contracting characteristics of production competition, and what are the feasible production competition options/alternatives?

The feasible production competition options/alternatives are Form, Fit, and Function, Technical Data Package, Leader-Follower, Directed Licensing, Contractor Teaming, Component Breakout, and Design Competition for Production Competition. Each is its own characteristics and advantages as outlined in Chapter III. Major weapon systems

are usually developed for unique military requirements, involve state-of-the-art technology, require lengthy development time, and are very expensive. This implies that considerations such as technology transfer, interaction between competitors, planned maintenance philosophies, ownership of technical data, award methodologies, the number of competitions to hold, and the number of suppliers to maintain over time must be carefully analyzed and contractually implemented.

3. What contingent characteristics of major weapon systems acquisition pre-production phases might substantively jeopardize the structure, nature and emphasis of the production competition strategy?

Early planning and action is the key to successful and effective establishment of production competition. Actions such as those presented in Chapter IV that provide future flexibility in the alternative production sourcing methodology decision can help preclude many difficulties encountered in the late FSD and production phases. Additionally, as discussed in Chapter V, funding is an area of consistent concern. Funding instability can cause tremendous barriers to establishing production competition.

4. What are the contracting issues that must be considered from a political, legal, economic, and regulatory perspective in formulating and implementing a production competition strategy?

This research effort consistently encountered the issues presented in Chapter IV that require analysis during contracting formulation. They are:

- Technical Data Issues
- Risk of Technology Transfer

- PMO Engagement in Establishing Production Competition
- Contractor(s) Cooperation/Opposition to Production Competition
- Support for Production Competition

D. RECOMMENDATIONS FOR FURTHER RESEARCH

A separate study should be conducted to determine the characteristics and utility of the Component Breakout methodology to further enhance the acquisition research body of knowledge.

Studies should be conducted to expand the list of consistently encountered program issues that affect contracting strategy formulation.

A study should be conducted that provides a detailed analysis of establishing production competition for programs already in the production phase.

APPENDIX

INTERVIEW QUESTIONNAIRE

1. At what point did you become involved with the program acquisition strategy? What was your role?

2. What program documents, i.e., JMSNS, PDM, POM, Other program functional plans, characteristics and regulatory requirements did you consider in formulating the contracting strategy?

3. Does this technique vary from program to program?

4. Describe the major internal and external factors that impact a major weapon system contracting strategy, i.e., SYSCOM, PMO internal, political, economic factors.

5. How much flexibility did you have in formulating the contracting strategy?

6. Describe the acquisition plan approval process? Relate any problem areas encountered in the approval process.

7. When was production competition targeted in the acquisition strategy?

8. Describe the effect of production competition upon the contracting strategy.

9. What are the key contractual issues to be considered and/or resolved in pre-production phases that plot an early course toward production competition?

10. What programmatical, contractual and policy events or changes arose during early phases that significantly affected the contracting strategy?

11. How were these issues resolved?

12. When was the technology transfer method selected, implemented, and what were the problems encountered in implementation?

13. How were you involved?

14. How often are the acquisition strategy and acquisition plan updated?

15. Describe unique contractual provisions that facilitate technology transfer in the methodology implemented?

16. How has pre-production phase competition facilitated production competition?

17. How is the contracting strategy/plan integrated with the other various functional implementation plans?

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