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DEFENSE SYSTEMS MANAGEMENT COLLEGE

PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

OVERVIEW OF DOD WEAPON SYSTEM ACQUISITION:
COURSE OUTLINE
LESSON OUTLINES
LESSON SYNOPSES

STUDY PROJECT REPORT
PMC 76-2

John W. Swarbrick
Industry

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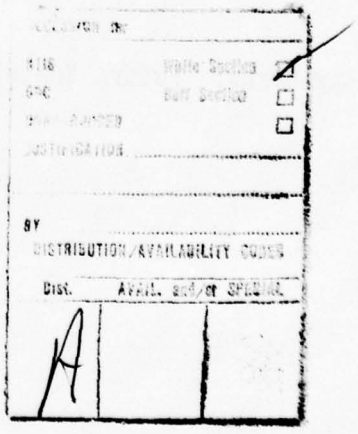
DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: Overview of DOD Weapon System Acquisition: Course Outline; Lesson Outline; Lesson Synopses

STUDY PROJECT GOALS: To develop a course to present DOD weapon system acquisition policies, procedures, objectives and environment to defense industry personnel involved with program management.

STUDY REPORT ABSTRACT: This study report provides an overall course outline, lesson outlines and a synopsis of each of the lessons developed for this course. The ten lessons are:

A. Weapon System Management-OSD Policies and Procedures;
B. DSARC/DCP Process;
C. PPBS and the Congressional Budget Cycle;
D. Layers of Authority in DOD and Organization by the Services for Program Management;
E. System and Design Discipline Policies;
F. Contract Types;
G. Procurement Cycle;
H. Requirements Evolution;
I. Overview of C/SCSC; and
J. Other DOD-Contractor Interfaces.



NAME, RANK, SERVICE	CLASS	DATE
JOHN W. SWARBRICK, INDUSTRY	PMC 76-2	NOVEMBER 1976

DEFENSE SYSTEMS MANAGEMENT SCHOOL

STUDY TITLE: OPERATIONS MANAGEMENT OF DOD SPACE MISSIONS IN THE SHUTTLE ERA

STUDY PROJECT GOALS:

To present a history of the DOD/USAF Space Shuttle program to date and recommend an approach to future government space operations which offers maximum interagency cooperation in DOD mission accomplishment with the NASA.

STUDY REPORT ABSTRACT:

This report presents a history of the development of the Space Transportation System (STS) to date between the National Aeronautics and Space Administration (NASA) and the executive agency acting for the Department of Defense, the United States Air Force. The STS consists of the NASA-developed space shuttle orbiter, the USAF-developed upper stage, the communications networks and launch base complexes of both agencies, and the satellite payloads developed by many user agencies to be placed in space. The program development is traced chronologically in terms of key joint-agency agreements, management interfaces, and compromises made as implementation of early proposals was accomplished.

A proposal is made to develop a joint-agency STS operations authority responsive to national command/policy channels.

Key Words: Future Space Operations; Joint-agency Management

NAME, RANK, SERVICE	CLASS	DATE
CHARLES J. TRINGALI, LtCol, USAF	PMC 76-2	10 November 1976

OVERVIEW OF DOD WEAPON SYSTEM ACQUISITION:
COURSE OUTLINE
LESSON OUTLINES
LESSON SYNOPSES

Study Project Report

Individual Study Program

Defense Systems Management College

Program Management Course

Class 76-2

by

John W. Swarbrick
Industry

November 1976

Study Project Advisor
Capt. Paul B. Tuzo III, USN

This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management College or the Department of Defense.

PREFACE

The notion to design this course package as my ISP came in the middle of a classroom lecture on dissemination of data and information after several weeks at DSMC, although the need for such a course should have been obvious, especially to the author, from the very start of the Program Management Course. The recognition of the need to provide personnel within the defense industry with an understanding of the workings and objectives of the DOD acquisition community is clearly evidenced by the encouragement of industry participation in the PMC and other DSMC courses. It should also be obvious that it is neither reasonable nor practical that a significant proportion of the defense industry management personnel actually attend courses at DSMC. Therefore, the utility of a distillation of the essentials of DOD weapon system acquisition policies, procedures and objectives into a short course that can be presented by the few industry PMC participants to large numbers of their colleagues after returning to their companies was the driving force for this study project.

COURSE OBJECTIVE

This course is intended to present an overview of weapon system acquisition from the DOD standpoint to Program/Project Managers, Project Engineers and Functional Managers within the Defense Industry. This course will briefly describe the procedures, policies, management objectives and environment with which or within which the DOD Program Managers/Program Offices must function. The goal is to develop an understanding, by those personnel who directly interface with DOD Program Offices, of the goals and constraints imposed upon their customer counterparts; in this way it is hoped that more amicable and efficient interfacing between the DOD and industry project teams can be realized.

NOTES ON COURSE PRESENTATION

This Individual Study Project, which consists of a Course Outline, Lesson Outlines and Lesson Synopses, is intended to be the basis of a course describing an overview of DOD weapon system acquisition. It is not intended that this package stand on its own as a self teaching course nor is it intended to include sufficient data that a person without a previous background could teach this course. This course is specifically designed to be taught by a graduate of the DSMC Program Management Course who has his lecture notes and additional reference materials available, and the PMC background to flesh out the skeleton of material provided herein. An alternative method of teaching this course would be by employing a team teaching technique wherein personnel with specific academic/work experience backgrounds could be selected to present the various lesson blocks.

It has been the goal of the author to include pertinent references within the body of the synopses should more detailed information be required. The references cited are predominantly DOD publications which should be available through DOD data services.

The planned method of instruction is primarily formal lectures although it should be recognized that the target audience will provide a very diversified background and discussions by attendees with specific experience or expertise should be encouraged. Specific teaching aids (such as view graphs) are not intended as these should be tailored by the instructor to fit the class format and areas of emphasis deemed appropriate for the specific audience.

COURSE OUTLINE

LESSON A	Weapon System Management-OSD Policies and Procedures
LESSON B	DSARC/DCP Process
LESSON C	PPBS and the Congressional Budget Cycle
LESSON D	Layers of Authority in DOD and Organization by the Services for Program Management
LESSON E	System and Design Disciplines Policies
LESSON F	Contract Types
LESSON G	Procurement Cycle
LESSON H	Requirements Evolution
LESSON I	Overview of C/SCSC
LESSON J	Other DOD-Contractor Interfaces

LESSON A

OUTLINE

WEAPON SYSTEM MGMT-OSD POLICIES & ORGANIZATIONS

I. Organization of DOD

II. President/OMB Policy-OMB Circular A109

III. OSD Program Management Policy-DODD 5000.1

IV. Key OSD agencies

- A. DDR&C
- B. ASD-Comp
- C. ASD-I&L
- D. DP&E
- E. DDT&E and CAIG

SYNOPSIS

WEAPON SYSTEM MANAGEMENT-OSD POLICIES & ORGANIZATIONS

The purpose of this lesson block is to acquaint the student with the organization and policies at the OSD (Office of Secretary of Defense) level in DOD. The first step is to understand that the two roles of DOD, fighting wars and developing/procuring/deploying weapon systems are split within DOD. The war making role is handled by the Joint Chiefs of Staff (JCS) reporting directly to the Secretary of Defense (SECDEF). The weapon systems acquisition role is handled primarily by the Services with support and guidance from various OSD level agencies.

Any discussion of policies should start at the top and as such the top policy guidance for weapon system acquisitions comes from the President's Office of Management and Budget (OMB) in their OMB Circular A109 (dated 5 April 1976). This circular is applicable to all major system acquisitions by the U.S. Government. The key provisions in this policy are:

(a) Express needs and program objectives in mission not equipment terms;

(b) Place emphasis on initial activities of the system acquisition process to allow competitive exploration of alternate concepts

(c) Preclude management layering and imposing reporting procedures and paperwork on Program Manager and Contractor.

(d) Identify a single Program Manager and provide him with budget guidance and a written charter.

The following key decisions are delegated to the Agency Heads (SECDEF in DOD)

(a) Identification and definition of mission need.

(b) Selection of competitive system concept(s) for test/demonstration phase.

(c) Commitment to Full Scale Development and Limited Production.

(d) Commitment to Production.

At the OSD level the policy guidance has been provided by the Deputy Secretary of Defense (DEP SEC DEF), originally by Packard with revisions by Clements, in DOD Directive 5000.1. This Directive is considered the master charter of all Program Managers within DOD. The major policy directions within 5000.1 are:

(a) Definition of a major Program

1. RDT&E $\geq$ \$50M (72\$)
2. Production $\geq$ \$200M (72\$)
3. National Urgency
4. Recommendation of OSD or Service

(b) Establish a philosophy of decentralization of Program Management.

(c) Specifies there shall be a single Program Manager with sufficient authority.

(d) Outlines the concept for the Defense System Acquisition Review Council (DSARC) and Decision Coordinating Papers (DCP).

The most prominent agency at the OSD level concerned with Weapon System acquisitions is the Director of Defense Research and Engineering (DDR & E).

DDR&E is the principle advisor and staff assistant to SECDEF and DEPSECDEF for scientific and technical matters, basic and applied research and RDT&E of weapon systems and defense materials. In accordance with DODD 5129.1

> "Under the direction, authority and control of SECDEF, DDR&E shall supervise all research and engineering activities in the Department of Defense. . . "

His primary responsibilities are:

(a) Act as chairman of the DSARC for validation and full scale development programs;

(b) Provide policy guidance for R&D efforts;

(c) Present R&D Program and Budget to Congress.

Three other major OSD activities are also heavily involved in weapon system acquisition: Assistant Secretary of Defense for Installations and Logistics (ASD-I&L); Assistant Secretary of Defense Comptroller (ASD-Comp) and the Director of Planning and Evaluation (DP&E). All of the above individuals are DSARC Principles. The ASD-I&L can be considered the business manager for DOD and as such he is responsible for all procurements. The ASD-Comp is the financial manager for DOD and administers the budgeting and fund allocating aspects of weapon system acquisitions. The DP&E is primarily concerned with the long range planning and threat assessment with respect to missions, equipage and force levels.

There are also two subordinate agencies at the OSD level which support the DSARC in non-voting capacities. The Deputy Director for Research and Engineering Test and Evaluation (DDT&E) is responsible for reviewing and approving test and evaluation (with emphasis on operational test and evaluation) on major weapon

systems. Although the DDT&E reports administratively to DDR&E he also has a direct reporting and responsibility channel to the SECDEF level. The Cost Analysis Improvement Group (CAIG) supports the DSARC through review and evaluation of program cost estimates and independent cost estimates. They also establish policies and procedures for cost estimating, cost/risk formulation and cost estimate preparation and presentation.

LESSON B

OUTLINE

DSARC/DCP PROCESS

I. Weapon System Acquisition Life Cycle

   A. Conceptual

   B. Validation

   C. Full Scale Development

   D. Production and Deployment

II. DSARC

   A. Established by DODD 5000.1

   B. Function and Composition

   C. DSARC Reviews

      1. DSARC I

      2. DSARC II

      3. DSARC III

      4. DSARC 0

III. DCP

   A. Areas of consideration

   B. SEC DEF Decision

SYNOPSIS

DSARC/DCP PROCESS

The intent of this lesson block is to describe the DSARC and DCP Process as a weapon system proceeds through the acquisition cycle.

The DOD Weapon System Acquisition Life Cycle consists of four major phases:

1. Conceptual-Where operational needs and technology come together for the first time. Many possible concepts and technologies can be brought to bear to satisfy a single operational need.
2. Validation Phase-The viable concept(s) that result from the concept phase are validated and evaluated. A typical technique in this phase is competitive prototyping. The start of validation is considered Program Initiation before validation there is no Program.
3. Full Scale Development-This is where the weapon system matures to a full militarized system capable of meeting all of the system requirements.
4. Production and Deployment-The weapon system now enters the inventory and becomes part of the operational forces.

The overall policy direction for weapon system acquisition, DODD 5000.1, establishes a procedure for review and approval before transitioning from one phase to the next. The review is acccmplished by the Defense Systems Acquisition Review Council (DSARC) who make a recommendation to the SECDEF. The supporting documentation for the DSARC review is the Decision Coordinating

Paper (DCP). The thresholds defined in 5000.1 are also referred to as DSARC thresholds and determine which programs must follow the DSARC process.

As indicated above the DSARC is an advisory rather than decision making body. The DSARC is composed of the following members:

Principles	Chairman
DDR&E (Dr. Currie)	Validation, F.S.D.
ASD-Comp (Mr. McClary)	-----
ASD-I&L (Mr. Shrontz)	Production
DP&E (Mr. Aldrich)	-----
ASD-I (Intelligence)	Co-chairman for
ASD-TACCS (Telecommunications)	I/TACCS Programs

Other Participants (non-voting)

Service Secretary

Chief JCS

Service Chief of Staff

Dep DDR&E-T&E

Chairman of CAIG

As presently defined in DODD 5000.26 there are three DSARC reviews which lead to approval to enter the next phase in the acquisition life cycle. These three reviews and their special attentions are:

DSARC I-Program Initiation-At this review the following key items will be determined:

-A valid military need exists

-No existing equipment can satisfy the need

-Requirements are adequately defined and economically plausible

-Major problems and risks are identified and methods for resolution are planned

-Program thresholds in DCP are reasonable

DSARC II-Full Scale Development-At this review the following key items will be determined:

-A valid military need exists and the system satisfies this need

-System trade offs have produced proper balance of cost/schedule/ performance

-Major uncertainties and risks have been reduced to acceptable limits and methods to resolve uncertainties and risks are planned

-Valid design to cost goals are established

-Program thresholds in DCP are reasonable

DSARC III-Production-At this review the following key items shall be determined

-The system still satisfies a military need

-Test results based on development and IOT&E are adequate to support production decision

-Estimate (cost & schedule) are realistic and affordable

-System trade offs have produced proper balance between cost/schedule/ performance

-Program thresholds in DCP are reasonable

-Issues concerning production, logistic support, etc. are identified and plans for resolution are sound

-All major problems have been revealed and solutions to residual risks have been identified

-Plans for transition to production and deployment is adequate

In addition to the above 3 DSARC reviews there are plans underway to establish a DSARC 0. This is in response to an element of policy established in OMB Circular A109, which defined the policy for system acquistion within the U.S. Government. The element in question is the requirement for the Agency head to identify and define the mission need. In this regard the DSARC 0 will become a review at the OSD level to validate the operational need prior the start of the conceptual phase. At this time it is unclear exactly how this is going to be accomplished.

As indicated before the DCP supports and actually forms the basis of the DSARC review. For on going programs the DCP is updated prior to each DSARC review. The DCP identifies and discusses the following areas:

-Need and threat

-Concept of system-level of detail appropriate to phase of program

-Milestones

-Thresholds-cost, schedule and performance thresholds the crossing of which indicate serious problems and will require reconsideration by the DSARC

-Issues and risks

-Alternatives

-Management Plan

-Supporting rationale for decisions

-Affordability (budget year and out years)

The DCP as modified by the DSARC is passed to the SECDEF with the DSARC recommendation. The SECDEF decision is consumated by his signing the DCP at which time it becomes a contract between the SECDEF and the Component Head (Service Secretary). The SECDEF decision can also be promulgated by the issuance of a Program Memorandum (PM) rather than the DCP.

LESSON C

OUTLINE

PLANNING PROGRAMMING & BUDGETING SYSTEM AND

CONGRESSION BUDGET PROCESS

I. Definitions

A. Planning

B. Programming

C. Budgeting

III. Planning Phase

A. JSOP I

B. DPPG

C. TPPG

D. JSOP II

E. PPGM

III. Programming Phase

A. JFM

B. POM

C. Issue Papers

D. PDM

IV. Budget Phase

A. Budget Guidance

B. Budget Estimates

C. PBD

LESSON C

OUTLINE (Cont'd)

V. FYDP

A. Program Elements

B. Program 6 Breakdown

VI. Congression Budget Process

A. Congressional Budget Act

1. Armed Services Committees

2. Appropriations Committees

3. Budget Committees

4. CBO

B. Process

1. Authorizations

2. Appropriations

3. Reconciliations

LESSON C

SYNOPSIS

PPBS and the Congressional Budget Cycle

This lesson block is intended to expose the student to the Planning, Programming and Budgeting System (PPBS) within DOD and the Congressional Budget Process.

Before we start into PPBS it is essential that we define Planning, Programming and Budgeting as used by DOD.

Planning-The process of determining force and support level objectives and specifying the future actions to accomplish mission requirements.

Programming-The process of translating approved manpower and material resource requirements.

Budgeting-The process of translating approved manpower and material resource requirements into time phased financial requirements.

The purpose of PPBS should be explained-to develop the DOD Budget and the Five Year Defense Plan (FYDP). The PPBS is approximately a 20 month cycle, therefore at any one time there are two or three PPBS processes at work.

The planning phase starts in May with the release of the Joint Strategic Objectives Plan, Vol I (JSOP I), by the Joint Chiefs of Staff (JCS). This is the basic statement of recommended military strategy without any fiscal restraints. The JSOP I goes to the OSD level who evaluate it and generate the Defense Policy Planning Guidance (DPPG) which is issued in September and becomes the definitive DOD Policy and Planning guidance. The DPPG goes to

the services and JCS for guidance in their preparation of subsequent documents. In October OSD also issues the Tentative Planning and Programming Guidance (TPPGM) which is an advance issue of the Planning and Programming Guidance Memorandum (PPGM) which will be discussed later. The TPPGM is the first time where fiscal constraints are imposed. The TPPGM is used by the services for advanced planning and preparation of their Program Objective Memorandums (POM's). In response to the DPPG and the TPPGM, the JCS issues JSOP II, in December. This is the Analysis and Force Tabulation Volume of the JSOP and presents the force requirements and military assistance levels consistent with the strategy in JSOP I and DPPG. The final step in the planning phase is the release by OSD of the PPGM in February. This document provides overall guidance for program development including: (1) defense policy and force planning guidance; (2) fiscal guidance; (3) material support planning guidance; and (4) POM preparation guidance.

The programming phase is again started by the JCS with their release of the Joint Forces Memorandum (JFM). This is the JCS recommended force levels within the fiscal constraints defined in the PPGM. The JFM is used by the services in their POM preparation. In May the services release their POM's (one per service), which are their recommendations to SECDEF for detailed application of resources. The POM's must be within the constraints of the PPGM and this is where most program squeezing is done. The POM covers the budget year and the following four years (which is the same as the FYDP which is also updated at this time). The System Analysis staff at OSD analyze the POM's and generate Issue Papers on selected items within the POM. These

documents define issues, usually cost, list alternatives and evaluate cost and capabilities of the alternatives. The Issue Papers are circulated to the JCS and services for comment before submission to SECDEF. The final step in the programming phase is the issuance of the Program Decision Memorandums (PDM) to the services (one per service) by the SECDEF in August. Essentially the PDM approves the POM with specific exceptions defined.

The budgeting phase is started from the top by release of Budget Guidance from OSD which includes the inputs from the President and his Office of Management and Budget (OMB). This guidance is issued to the services to be used in the preparation of their Budget Estimates. These estimates are the financial requirements to execute the PDM direction. The service Budget Estimates are submitted to OSD where they are evaluated and the Program Budget Decisions (PBD) are generated in December. The PBD is the definitive SECDEF decision on budgets. The services can reclama a PBD's and after all hearings and reclama's the PBD's become the DOD proposed budget which is submitted to the President and OMB for inclusion in the overall federal budget.

Before plunging into the Congressional Budget process a few parenthetic words about the FYDP are appropriate. The FYDP has been around for quite a while, but now in response to OMB direction it is mandatory as is five year planning for all departments in the Executive Branch. The FYDP contains three items-Forces, Manpower, Dollars. The Force requirements are shown for eight years (same as the JFM) and the manpower and dollars are shown for five years. The FYDP is broken down into ten Program Elements or Major Force Programs:

1. Strategic Forces
2. General Purpose Forces

3. Intelligence and Communications

4. Airlift and Sealift

5. Guard and Reserve Forces

6. Research & Development

7. Central Supply & Maintenance

8. Training, Medical & Personnel

9. Support of Other Nations

10. Administration

It should be noted that the above elements are mission oriented and no service identification is included. Since weapon system acquisiton is the subject of this course a deeper dissection of Program 6 is appropriate. Program 6 is broken down as follows and these numbers are commonly used to denote the different classes of R&D funding:

6.1 Research

6.2 Exploratory Development

6.3 Advanced Development

6.4 Engineering Development

6.5 RDT&E Mgmt Support

6.6 Operational Systems Development (funded by Elements 1, 2, 3, 4, 5, 7, 8, or 9)

As a program progresses through its life cycle it can be changed from a Program 6 to another Program Element (e.g. Program 1 or 2) once a commitment to field the equipment is made.

The Congressional Budget Act, which was fully in force for the first time with the FY77 budget, established a Congressional Budget Process. The key provisions of the Congressional Budget Act were:

(1) Creation of new House and Senate Budget Committees to oversee the budget process.

(2) Establishment of the Congressional Budget Office (CBO) to support the Budget Committees

(3) Revision of the fiscal year to run from 1 October to 30 September.

The Congressional Budget Process formally starts with the presentation of the President's Budget in January although initial studies and ground work by the CBO are already underway. The President's Budget goes to the CBO for analysis and goes to the authorizing committees. In our case the House and Senate Armed Services Committees generate the Authorization Bills in the January to June time-frame. In parallel the Budget Committees have been developing the First Budget Resolution which is passed in June. The House and Senate Appropriations Committees then start their deliberations which result in the Appropriations Bills. Also in parallel, but not disconnected, the Budget Committees prepare the Second Budget Resolution which includes the provisions of the Appropriations Bills. This process and the reconciliation between the two houses must be completed before 30 September (end of the fiscal year). The Appropriations Bills then go to the President for approval (or veto). After approval the DOD budget is sent to OSD for execution.

LESSON D

OUTLINE

LAYERS OF AUTHORITY IN DOD AND ORGANIZATION
BY THE SERVICES FOR PROGRAM MANAGEMENT

I. OSD Level

A. Organization of DOD for Acquisition

B. Reporting

1. Selected Acquisition Reports (SAR)

2. Clements letters

II. Air Force

A. Organization

1. Air Staff

a. Air Force Test and Evaluation Center (AFTEC)

2. Air Force Systems Command (AFSC)

a. Aeronautical Systems Division (ASD)

b. Space and missile Systems Org. (SAMSO)

c. Electronic Systems Div. (ESD)

d. Armament Dev. and Test Center (ADTC)

e. Laboratories

3. Air Force Logistics Command (AFLC)

a. Acquisition Logistics Dir (ALD) (ATCA)

B. Reporting

1. Selected Acquisition Reports (SAR)

2. Program Assessment Review (PAR)

3. Command Assessment Review (CAR)

III. Navy

A. Organization

1. Chief Naval Operations (CNO)

a. Operational Test and Evaluation Force (OPTEVFOR)

2. Chief Naval Material (CNM) (NAVMAT)

a. System Commands

b. CNM Project Managers

c. R&D Centers and Laboratories

B. Reporting

a. Selected Acquisition Reviews

b. Quarterly Project Status Reviews

c. CNO-Executive Board (CEB) Reviews

IV. Army

A. Organization

1. Dept. of Army

a. Operational Test and Evaluation Agency (OTEA)

2. Development and Readiness Command (DARCOM)

a. Commodity Commands

3. Training and Doctrine Command (TRADOC)

B. Reporting

1. Selected Acquisition Review

2. Dept of Army Review (DAPR)

3. Review and Command Assessment of Programs (RECAP)

SYNOPSIS

LAYERS OF AUTHORITY IN DOD AND ORGANIZATION BY THE SERVICES FOR PROGRAM MANAGEMENT

The intent of this lesson block is to display the various organizations within the Services that execute Program Management and the several layers of authority and levels of review within the DOD.

Within DOD the authority for procurement is vested in the military secretaries and the Director of the Defense Supply Agency (DSA). At the OSD level procurement policy is established by the Assistant Secretary of Defense for Installations and Logistics (ASD-I&L) and the ASPR Committee. The formal reporting system to the OSD level on individual programs is the Selected Acquisition Report (SAR) (in accordance with DOD Instruction 7000.3). The SAR is a comprehensive status report, in standarized format, on major acquisitions. The heart of the SAR are technical problems/status, schedule and program costs. The SAR is formatted to meet the needs of both OSD review and Congressional review. The SAR's are prepared quarterly and submitted through the Service Secretaries to SECDEF for transmission as requested, to the House and Senate Armed Services and Appropriations Committees and GAO. In addition to these formal reports, DEPSECDEF Clements has requested that the Program Managers of selected major programs send him an informal one page status letter (handwritten is acceptable) for his information only to keep him abreast of the program on a monthly basis. The Air Force is probably the most structured organization for acquisition of the Services. The procurement authority vested in the Sec'ty of Air Force is delegated to the Air Force Chief of Staff. At the Air Staff level the key player is the Program Element Monitor (PEM), who is the officer that

worries and works the program in the Pentagon. Also reporting to the Air Force Chief of Staff is the Air Force Test and Evaluation Center (AFTEC) which is the independent Test and Evaluation agency within the Air Force. Below the Air Staff level there are two major commands involved in the procurement activities: Air Force Systems Command (AFSC) and Air Force Logistics Command (AFLC). The Air Force is unique in this division of development and logistics at this high level. Within AFSC there are several product divisions (Aeronautical Systems Division, Electronic Systems Division, Space and Missile Systems Organization), the Armament Development and Test Center (ADTC) and the various Air Force Laboratories. The basic organization for program management within the product divisions is the System Project Office (SPO). In order to promote coordination between AFSC and AFLC on development programs a new organization has been established within AFLC to work development programs, Acquisition Logistics Division (ALD). As an indication of the importance given to ALD, the acquisition of the Advanced Tanker/Cargo Aircraft (ATCA) has been delegated to ALD. In addition to the formal chain of command communications, within the Air Force a special Blue Line channel has been established by regulation (AFR 800-2) which provides a direct line of communication from the Program Manager (SPO Director) to the Commander of the implementing command, the chief of staff and the Secretary of the Air Force.

The reporting and review heirarchy within the Air Force starts with the Selected Acquisition Report which has already been discussed. Next is the Program Assessment Review (PAR) which is presented to Hqtrs AFSC. Occasionally this review is also presented to the Secretary of the Air Force and is then

called a Sec'ty Air Force Program Review (SPR). PAR's are conducted on major AFSC programs. On a quarterly basis the PAR is presented by the Program Manager and normally takes 20 to 30 minutes. On the intervening months, a monthly update is provided by the System Staff Officer (SYSTO). For AFSC systems that do not warrant PAR/SPR reviews Command Assessment Reviews (CAR) are presented to the Commander of AFSC. Both the PAR and CAR are intended to be the major management tool of the Commander of AFSC for reviewing progress and evaluating adequacy of management of AFSC programs.

The Navy organization for acquisition again starts with the Service Secretary (SECNAV) who has delegated the acquisition responsibility to the Chief of Naval Operations (CNO). The CNO has reporting to him the Chief of Naval Material (CNM) and the Commander of the Operational Test and Evaluation Force (OPTEVFOR) which is the Navy's independent operational test and evaluation agency. Within the Naval Material Command (NAVMAT) are the various System Commands (NAVAIR, NAVSEA, NAVELEX), the R&D Centers and Laboratories and the CNM Project Managers. It should be noted that the CNM Project Managers are not within the SYSCOM's but are in essence in a staff role to CNM. Also the Navy tends to have very small project offices with most of the work farmed out to the functional areas in the SYSCOM's as contrasted to the Air Force which tends to establish large, almost monolithic program offices which are self contained.

Since the Navy is not quite as structured as the Air Force its reviews and reporting system is also simpler. Again the SAR is used on designated major programs to report status to OSD and Congress. For specified major programs the highest level Navy review is the Quarterly Project Status Review which is

presented to the CNM and normally the Ass't SECNAV for I&L. At this review the commander of the cognizant SYSCOM, the OPNAV (CNO staff) sponser and the CNM Project Manager all participate. For other designated major acquisition projects reviews are conducted by the Commander of the cognizant SYSCOM and/or the CNM Project Manager. One other activity also gets involved in reviewing projects normally on an exception basis and that is the CNO Executive Board (CEB). The CEB has a subpanel called the Acquisition Review Council (ARC) which exercises program monitoring responsibility for CNO designated programs.

The Army organization and philosophy for acquisition is sort of a cross between the Air Force and the Navy. At Dept of the Army Staff the Deputy Chief of Staff for Research Development and Acquisition (DCSRDA) is responsible for monitoring overall policies and procedures for acquisition management in the Army. DCSRDA also appoints the Dept of Army System Coordinator (DASC) who is the equivalent of the Air Force PEM or SYSTD. Also reporting at the Staff level is the Operational Test and Evaluation Agency (OTEA) which is the Army's independent operational test and evaluation agency. Next down in the organizational chain is the Development and Readiness Command (DARCOM) which formerly was Army Material Command. DARCOM can be considered to be the equivalent of combining the Air Force's AFSC and AFLC. Within DARCOM are the various commodity commands (MICOM, TACOM, etc). The current policy is to split the commodity commands into a commodity (e.g. Missiles) development command and a commodity readiness command (i.e. logistics) to separate the development from logistics. On other command, Training and Doctrine Command (TRADOC) also is heavily involved in the acquisition cycle. TRADOC represents the user during the acquisition process. As far as

philosophy of program office size, the Army covers the full spectrum from very large, a la the Air Force, to very small like the Navy. The Army also makes a specific distinction in the titles for its managers. Program Managers are general grade officers who are responsible for very large and significant programs (e.g. the PATRIOT System) and the Program Manager reports directly to the Secretary of the Army. Project Mangers are usually full Colonels who are responsible for major programs (e.g. UTTAS the PM reports to Aviation Command). Project Managers are those managers of projects that no longer meet the criterion for Program or Project but still warrant centralized management.

The reporting and review process is again led by the SAR. The next step down is the Dept of Army Review (DAPR). The DAPR is presented to Headquarters Army after a pre-DAPR has been presented to DARCOM. The DAPR is used only on selected major programs and the reviews are held quarterly. For programs that are not selected for DAPR the Review and Command Assessment of Projects (RECAP) is used to provide monthly status reports from the Project and Product Managers to the Commander of DARCOM.

LESSON E

SYSTEM & DESIGN DISCIPLINE POLICIES

I. Design to Cost & Life Cycle Cost (DODD 5000.28)

II. Intergrated Logistics System (DODD 4100.35)

III. *Standardization* (DODD 4120.3)

IV. Test and Evaluation (DODD 5000.3)

SYNOPSIS

SYSTEM AND DESIGN DISCIPLINES

The intent of this lesson block is to present the objectives, concepts and policies established by OSD relating to Design to Cost, Integrated Logistics Systems, Standardization and Test and Evaluation. This block will not discuss the procedures or techniques required to use these disciplines but hopefully will make the student aware of the major policies within DOD that control the application of them during major weapon system acquisition.

The policy and guidance for Design to Cost is provided by DOD Directive 5000.28. Design to Cost must be applied to all programs that meet the DSARC thresholds and the concept is applicable to all acquisitions of defense systems, subsystems, and components. The DODD defines Design to Cost as the management concept wherein vigorous cost goals are established during development and control of systems costs (acquisition, and operating and support) to these goals is achieved by practical trade offs between operational capability, performance, cost and schedule. The Design to Cost Goal is defined as a specific dollar amount in constant dollars based upon a specific production quantity and rate. The Life Cycle Cost of a system is the total cost to the government of acquisition and ownership of that system over its full life (acquisition, operation, support and disposal). The objective of Design to Cost is to establish cost as a parameter <u>equal</u> in importance with technical requirements and schedule throughout the design, development, production and operation of the system. The policies with respect to the Design to Cost concept are:

1. Establish cost as a design parameter
2. LCC objectives will be established early and as development

of the ILS policies are

1. Operational capability and availability of systems require a adequate and timely logistic support planning.

2. Planning the logistic support requirements shall begin in the Conceptual Phase.

3. The logistic support program must be formalized at the beginning of Full Scale Development with appropriate performance milestones throughout development, production and deployment.

The general principles and policies established to meet the above concepts and objectives are:

1. RFP's for Conceptual and Validation Phases shall outline qualitative and quantitative ILS requirements.

2. Since over the life cycle, support is usually the major portion of the LCC, the following policies are established

   a. Design of all operational systems, including off-the-shelf, shall consider ILS aspects

   b. Planning, management and design of ILS shall proceed with continuity throughout the life cycle and shall be kept in phase with the rest of the program.

3. The DCP shall specify that the Program Manager shall develop an ILS plan, with milestones, at the beginning of Full Scale Development.

For additional information and specific implementation regulations, refer to the "Integrated Logistic Support, Implementation Guide for DOD Systems and Equipments" (ref Army TM 38-710, Navy NAVMAT P-4000, Air Force AFP 800-7).

The policy for Standarization is established in DOD Directive 4120.3. The purpose of the directive is to:

continues LCC elements will be established and DTC goals fixed.

3. During design and development cost will be reviewed with the same vigor as technical parameters.

4. Cost goals established and "designed to" will be carried in subsequent phases of the life cycle. Production costs will be controlled to production goals.

The directive also establishes two policies with respect to Design to Cost Goals

1. At present Average Unit Flyaway (Rollaway, Sailaway) cost will be used. As data and expertise in LCC expands, LCC will be used as the primary parameter

2. Although DTC aims at production cost, trade offs will consider all elements of LCC.

The key consideration from a program management standpoint on Design to Cost is that DTC has become a major element of review during the DSARC/DCP process. Specific DTC goals and LCC estimates must be included in the DCP for DSARC II. For additional information and specific implementing regulations the student is referred to the Joint Design-To-Cost Guide (DARCOM P700-6, NAVMAT P5242, AFLCP/AFCSP 800-19).

The policy for Integrated Logistics Systems (ILS) is established in DOD Directive 4100.35. The policies contained therein are applicable to system/equipment acquisitions and operation including modification of existing systems/equipment and those procured off-the-shelf. The directive defines ILS as a composite of all the support considerations necessary to assure the effective and economical support of a system for its life cycle. The concepts and objectives

1. Establish the policies and responsibilities for the Defense Standarization Program (DSP).

2. Establish the Defense Material Specification and Standards Board.

3. Provide for the continuance of the Defense Standardization Manual (4120.3M).

The objective of standardization is to establish control of item proliferation within DOD through exercise of disciplines and procedures prescribed by the Defense Standarization Manual by:

1. Preventing the preparation of duplicative and overlapping descriptions of materials and services.

2. Fostering the re-use of existing technology to satisfy new equipment/system requirements.

3. Establish uniform type grades, classes and sizes of items and performance requirements which define physical properties of material.

4. Developing methods for systematically reviewing items in the inventory to reduce or eliminate varieties.

The directive also defines the composition and responsibilities of the Defense Material Specifications and Standard Board and specifies that it shall be responsible to the DEPSECDEF with administrative supervision provided by ASD (I&L).

Policy for Test and Evaluation (T&E) within DOD is established in DOD Directive 5000.3. This directive also codifies the responsibility of the Deputy Director of Research and Engineering for Test and Evaluation (DDT&E). The

policies are applicable to programs that meet the DSARC thresholds, however, the principles are valid for lesser programs. The directive establishes the following Policies and Principles:

1. Commence Test and Evaluation as early as possible.
2. The acquisition schedule should be based, inter alia, upon accomplishing T&E milestones prior to commitments of significant resources.
3. Before initiating new system test and evaluate the possible use of existing systems.
4. All T&E activities will consider environmental issues.

Test and evaluation is differentiated into two categories: Development Test and Evaluation (DT&E); and Operational Test and Evaluation (OT&E). The objectives and policies for these two categories are summarized below.

DT&E-That T&E conducted to demonstrate engineering design/development is complete, design risks have been minimized, the system will meet it's specifications, and to estimate the system's military utility. The following policies are applicable to DT&E:

1. DT&E shall start as early as is feasible.
2. During the Validation Phase, DT&E shall be conducted to demonstrate that technical risks are identified.
3. During Full Scale Development, DT&E shall ensure that the engineering is reasonably complete, and all significant design problems have been identified and solutions are in hand prior to proceeding into production phase.

OT&E-That T&E conducted to estimate a prospective system's military utility, operational effectiveness and operational suitability, and to identify any need for modifications. In each DOD component there will be one major field agency separate and distinct from the developer/ procuring agency and from the using command which is responsible for OT&E. (ARMY-OTEA, Navy-OPTEVFOR, Air Force-AFTEC). This independent operational test agency shall:

1. Report results directly to the Military Service Chief.
2. Recommend to the Military Service Chief the accomplishment of adequate OT&E
3. Insure that OT&E is effectively planned and conducted.

Two major program considerations are also defined in the directive. The first is that the Test and Evaluation Master Plan will be prepared as early as possible but in no case later than the start of Full Scale Development. The second is that the DCP for all phases must include details on the T&E accomplished and planned.

LESSON F

OUTLINE

CONTRACT TYPES AND PROFIT

I. Types of Contracts

A. Fixed Price

1. FFP

2. FPE

3. FPIF

4. FPI-S

5. FP-LOE

B. Cost Reimburseable

1. CPPC (illegal)

2. CPFF

3. CPIF

4. CPAF

5. T & M

II. Profit/Fee

A. Profit '76 Study

B. Comparison of Weighted Guidelines Before and After Profit '76 (DPC #76-3)

SYNOPSIS

CONTRACT TYPES AND PROFIT

The intent of this lesson block is to describe the various types of contracts used by the DOD in weapon system acquisitions. This is not a course in Contract Management, but rather an overview with the purpose of describing the salient characteristics of the various types of contracts and their applicability to given conditions. This lesson block also discusses the profit policies which have just recently been revised.

There are two fundamental classifications of contracts: (1) Cost Reimburseable; and (2) Fixed Price. In the Cost Reimburseable contracts the contractor is reimbursed for allowable, not all, actual costs incurred and a fee is added based on the nature of the contract. In the Fixed Price contracts the contractor in essence commits to perform under the contract for a fixed price, which includes profit, regardless of actual costs incurred. These two classifications are further broken down as explained below.

The simplest contract type is the Firm Fixed Price (FFP) (ref ASPR 3-404.2) which just as its name implies is a contract wherein the contractor performs the contract for the stated price. The contract makes no distinction between cost and profit, and then is no adjustment for actual cost. FFP contracts are used where the risks and unknowns are very low and where the duration of the contract is relatively short. Both of these conditions yield a situation where the cost of performing under the contract can be established a priori with a high degree of confidence. Typical FFP applications are follow-on production or purchases of standard off the shelf

equipment. An FPP contract is the simplest contract to formulate and administer.

The next contract type for consideration is the Fixed Price with Escalation (FPE) (ref ASPR 3-404.3). This is almost indentical to the FFP except provisions are included to account for escalation during the performance of the contract. The contract is structured to identify what classes of costs (labor, material, etc) are subject to escalation adjustment and what criteria (e.g. price index) will be used for the adjustment. The conditions wherein an FPE contract would be used are the same as an FFP except it may cover a longer time period or some cost elements may contain risk due to escalation.

Fixed Price Incentive, Firm Target (FPIF, sometimes mistakenly called fixed price incentive fee) (ref ASPR 3-404.4(2)) is the next step in increasing complexity. The concept of the FPIF is to establish a firm target price and then a profit or fee adjustment formula based on cost outcomes. The contract establishes a ceiling price, a target price, a target profit and a share ratio between the government and the contractor for costs above or below target. As currently implemented FPIF contracts are administered very similarly to cost type contracts because actual costs are usually specified to be "allowable costs" which means that full disclosure and audit of the contractor's cost accounting records is required. FPIF contracts are used where FFP is not appropriate usually because of increased risk or uncertainty and it is felt that the incentive feature will benefit the government.

One step beyond FPIF is the Fixed Price Incentive-Successive Targets (FPI-S) (ref ASPR 3-404.4(3)). In this contract type the initial target

cost, target profit, share ratio and ceiling price are established during negotiations and once the contract is executed, work commences. However, at a specified point in the conduct of the contract, the target cost, target profit, share ratio and ceiling are revised based on the criteria or formula defined in the original contract. This type of contract is used where sufficient pricing data is not available at the outset but all other conditions indicate that an FPIF contract is appropriate. A typical application is a second production run where the first run is still underway and sufficient valid cost data is not yet available.

The final type of fixed price contract to be discussed is the Fixed Price Level of Effort (FP-LOE) (ref ASPR 3-404.7). This type of contract is used wherein a general description of the desired effort is available but no specific performance is defined and the output is data. The most common application of FPL-LOE contracts is in research and exploratory development efforts.

The first type of cost contract to be discussed is one we will never see-Cost Plus Percentage of Cost (CPPC)-this type of contract is prohibited by law for reasonably obvious reasons.

The most straight forward of the cost contracts is the Cost Plus Fixed Fee (CPFF) (ref ASPR 3-405.6). In this contract type, the fee is a fixed amount (in dollars, not percentage) independent of costs incurred, which are fully reimbursed, or any other measure of performance. CPFF contracts are used where cost reimbursement is appropriate due to uncertainty and measurement of achievement does not lend itself to objective or subjective evaluation or incentivization would not benefit the government.

Cost Plus Incentive Fee (CPIF) (ref ASPR 3-405.4) is very similiar to CPFF except the fee is adjusted based upon performance. Target cost, target fee, maximum and minimum fees and the contractor/government share ratio are established in the contract. The incentive structure can be based solely on cost (i.e. under target cost yields larger fee and vice-versa) or can be a multiple incentive structure including technical performances and/or schedule in addition to cost. When considering a multiple incentive contract, both the government and contractor should recognize the implied value of the technical performance or schedule performance with respect to the cost incentive and assure themselves that the implied value is indeed the intended value. The key element concerning the fee structure is that it is objectively defined in the contract such that the fee can be calculated without any subjective judgements. CPIF contracts are most commonly used in RDT&E efforts for new systems where risk and uncertainty is present but success is probable.

Cost Plus Award Fee (CPAF) (ref ASPR 3-405.5) is used in cases similiar to CPIF except that specific objective fee criteria cannot be defined and subjective criteria is the best available. In this contract type the base fee (similiar to fixed fee) is specified in the contract (no more than 3% per ASPR) and then the award range and criteria are defined. The key characteristic of CPAF is that the award is unilaterally established by the government and cannot be contested under the "Disputes" clause in the contract.

The final cost reimburseable contract to be discussed is the Time and Material (T&M) (ref ASPR 3-406.1). This type of contract is used for service

or support contracts where the exact nature of the effort is known and therefore specific rates (direct labor, overhead, G&A profit) are established and the government then buys this effort "by the pound".

In summary, the typical applications of the various contract types by phases of the acquisition life cycle are:

Conceptual-CPFF (or cost sharing)

Validation-CPIF, CPAF

Full Scale Development-CPIF, FPIF, FPI-S

Production-FFP, FPIF, FPE

DOD policies with respect to profit paid to defense contractors has recently been revised (DPC #76-3 dated 1 Sept 76) as a result of a DOD sponsored study (Profit '76). The fundamental profit policy, which is to pay fair and reasonable prices, is unchanged however, the thrust of Profit '76 is summarized in a quote by DEPSECDEF Clements who directed Profit '76.

> "Our goal is to develop policy revisions needed to motivate defense contractors to make investments which will reduce Defense Department acquisition costs."

As such the basis for establishing prenegotiation profit objectives, which is the Weighted Guidelines in ASPR 3-804.4, has been revised to reduce emphasis of the cost of the contract to allow consideration of the cost of investment capital. A summary of the previous weighted guidelines and the revision is shown below.

PROFIT FACTOR	MEASUREMENT BASE	WEIGHT PRE PROFIT 76	RANGES PER DPC 76-3
A. Contractor Effort	Booked Cost for each item		
Material Acquisition			
. Subcontract items		1-5%	1-5%*
. Purchased parts		1-4%	1-4%*
. Other Material		1-4%	1-4%*
Engineering			
. Direct labor		9-15%	9-15%*
. Overhead		6-9%	6-9%*
Manufacturing			
. Direct labor		5-9%	5-9%*
. Overhead		4-7%	4-7%*
Other			
. General Management		6-8%	6-8%*
B. Contractor Risk	Booked Cost	0-7%	0-8%
C. Facilities Investment	Facilities Capital Employed	0	6-10%
D. Record of Contractors Performance	Booked Cost	+2%	0
E. Special Factors			
. FMS	Value of FMS order	0	1-4%
. Productivity	(see ASPR 3.808.8)	0	1-4%
. Independent Development	Booked Cost	0	1-4%
. Other	Basic Profit Objective	+2%	+5%

* An adjustment factor of 0.7 is applied to all Contractor Effort to arrive at dollar profit objective.

The net impact of the revised profit basis is probably no significant immediate change in profits on defense contracts, however, the goal of DOD is that by now recognizing, and rewarding, capital investments that DOD contractors will revise upward their capital investment policies and thereby increase profits and benefits to the government.

LESSON G

OUTLINE

PROCUREMENT CYCLE

I. ASPR

II. Formal Advertising Procurements

- A. Formal Advertising
- B. Two Step Formal Advertising

III. Negotiated Procurements

- A. RFP/Proposal Cycle
- B. Source Selection (DODD 4105.62)
- C. Four Step Process

SYNOPSIS

THE PROCUREMENT CYCLE

The intent of this lesson block is to describe the procedures used to initiate and execute a government procurement. There are fundamentally two types of procurements, formal advertising and negotiated. The latter type, negotiated, does not require that there be an actual auction or price haggling negotiation, it is merely the title given to any procurement which does not follow the procedures for formal advertising. The procedures for both types of procurements are included in the Armed Services Procurement Regulation (ASPR) which is the governing regulation for all procurements by DOD. The content of ASPR is approximately 85% administrative procedures, which are subject to revision by action of the ASPR Committee within DOD. The remaining 15% is statute and requires legislative action to accomplish changes.

Of the two types of procurements, formal advertising accounts for the majority number wise of the procurements by DOD, however procurement by negotiation accounts for the higher dollar volume. Formal advertising is used where the product or service can be definitively specified and the only criteria for selection is price. The formal advertising procurement (ref ASPR 2-100) starts with the preparation of specifications, etc for inclusion in the Invitation for Bids (IFB). Once the IFB is prepared, a public announcement must be made (Commerce Business Daily) to allow potential suppliers to make applications to the bidders list. The IFB is then sent to all bidders. The bidders return the IFB unaltered except the appropriate blanks (price, discounts, etc) are filled in. At the appointed time the bids are opened in public. The bids

subsequently are reviewed for responsiveness and vendor qualifications and the award is made (Firm Fixed Price or Fixed Price with Escalation Contract).

In those cases where the formal advertising procedure defined above cannot be used there is a procedure called Two Step Formal Advertising (ref ASPR 2-500) which can be used when the following conditions exist:

(1) Available specifications are indefinite or overly resrictive;

(2) A firm criteria for evaluation of proposals exist;

(3) There is more than one technically qualified source;

(4) There is sufficient time to pursue this procurement procedure;

(5) The resulting contract will be FFP or FPE

The two step formal advertising procedure starts with preparation of the Request For Technical Proposal (RFTP) which includes specifications as available and any other descriptive data on the desired product. Once the RFTP is prepared there again must be a public announcement to allow applications to the bidders list. The RFTP is released to the bidders. It should be noted here that the RFTP requests only technical proposals in response to the technical requirements in the RFTP, no cost or price proposals or bids. The technical proposals are received and evaluated to determine which proposers are technically acceptable. Then an IFB is issued only to the acceptable bidders for price bids. These bids are received and evaluated (soley on price considerations since all bidders are technically acceptable) and the contract is awarded.

In those cases where formal advertising, in either version, is not appropriate then procurement by negotiation is used. The ASPR defines 17 criteria, one of which must be cited and included in the Determination and Findings (D&F)

which authorize procurement by negotiation. A few of the more commonly used criteria are: National urgency; impractical to secure by competition; RDT&E; classified purchases; and substantial investment. The RFP/Proposal cycle can be briefly described as follows:

1. The Program Office initiates a Procurement Request (PR) and generates a technical Statement of Work (SOW).
2. Based on the PR and SOW an Evaluation Plan is established. Moreover the evaluation criteria is also defined for inclusion in the RFP.
3. A draft RFP may be circulated to prospective contractors for comment before formal release and these comments may impact the SOW and the Evaluation Plan.
4. The RFP is released to the prospective contractors who prepare and submit their technical, cost and management proposals (as required in the RFP).
5. The proposals are evaluated in accordance with the Evaluation Plan and selection is made (this last step is explained below).

The Source Selection process is defined by DOD Directive 4105.62 which requires the establishment of the three organizational entities:

1. The Source Selection Authority (SSA)-This is the Service Secretary although he may delegate his authority to lower levels. The SSA is responsible to assure competition, to appoint the Source Selection Advisory Council (SSAC), and to make the source selection.
2. Source Selection Advisory Council (SSAC)-This is a senior advisory

group who establish the selection criteria, select the Source Selection Evaluation Board (SSEB), review SSEB findings and contractors past performance, and prepare proposal analyses and the justification for the SSA decision.

3. Source Selection Evaluation Board-This is the group that actually evaluates the proposals in accordance with the selection criteria. The SSEB does not recommend a contractor, but rather evaluates the individual proposals (usually using a color code rather than numerical ratings) and includes a narrative assessment of each proposal. The SSEB also supports the SSAC and SSA through briefings and consultation.

A further refinement of the negotiated procurement process, called the Four Step Process, is currently under experimentation and if found advantageous may become a standard policy. The four step process can be outlined as follows:

(1) Separate the technical proposals from the remainder of the proposals (cost, management, etc.) and evaluate independently; discuss the proposals with the contractors (technical fact finding).

(2) Entertain updates to cost and technical proposals based on the contractor discussions. Based on the updated cost and technical proposals establish the competitive range (cost and technical) and advise the eliminated contractors. Again hold discussions with the remaining contractors to establish credibility of cost and technical proposals (cost and technical fact finding).

(3) As a result of discussions again entertain updates of cost and technical proposals from remaining contractors-best and final offers. Evaluate best and final offers, select winner, notify all contractors.

(4) Negotiate contract.

LESSON H

OUTLINE

REQUIREMENTS EVOLUTION

I. Air Force

A. ROC/Mission Analysis
B. ROC Validation
C. Technology Roadmap
D. PMD
E. Draft DCP
F. Consolidated Reviews
G. DSARC I

II. Navy

A. Draft OR
B. CEB/ARC
C. OR & DP
D. Draft NDCP
E. Draft DCP/PM
F. CEB/ARC/SECNAV
G. DSARC I

III. Army

A. Materiel Concept Investigation
B. LOA
C. ODP
D. Draft DCP
E. ASARC
F. DSARC I

SYNOPSIS

REQUIREMENTS EVOLUTION

The intent of this lesson block is to develop in the student an understanding of the evolution of requirements for major weapon systems from the point where an operational need or deficiency is first recognized or suspected to the completion of the conceptual phase of the acquisition life cycle. Since, under the current procedures, the conceptual phase is completely within the jurisdiction of the services (OSD first gets involved at DSARC I) it is not surprising to see different approaches to the development of requirements by the three services.

The Air Force system can be initiated in either of two ways: (1) the operating commands can establish an operational need or deficiency which is expressed in a Required Operational Capability (ROC). Alternately mission analysis, conducted by HQ AFSC with support from the operating commands and the product divisions, can identify an operational deficiency. In either case both of these actions (ROC usually from operational command and mission analysis to validate need and establish system concepts) must be completed before proceeding. The next step is ROC Review and Recommendations by AFSC. This review by AFSC and its product divisions includes consideration of alternatives, status of technology, environmental impact and recommendations. With the recommendations from AFSC the ROC is then forwarded to Air Staff for validation. This validation includes preparing the plan to evaluate the requirement, initiating and conducting studies, and evaluating technical approaches submitted by AFSC and AFLC. In parallel with the Air Staff ROC Validation, the Technology Roadmap is being developed by the appropriate

Air Force Laboratories. The Technology Roadmap is a schedule of technical capabilities and supporting tasks required to attain the capabilities defined in the ROC. Following the Technology Roadmap are any Advanced Development Programs or Demonstrations which physically implement the tasks established by the Technology Roadmap in those cases where demonstrated feasibility for key subsystems and components must be demonstrated before reaching a program decision. HQ USAF directs and guides the Conceptual Phase of the program by a Program Management Directive (PMD) which is issued at this time. After receipt of the PMD, AFSC establishes the program priority and issues guidance and direction to the AFSC organizations via AFSC Form 56, AFSC Program Direction (known as a Form 56). The next step can be considered the first point when the program becomes a reality. The AFSC organization (usually one of the product divisions) establishes the Program Office Cadre who then defines the Operational Concept (including preliminary design in house or contracted), conduct feasibility and risk assessments, assess production feasibility, estimate the logistics support, conduct preliminary cost estimates including LCC, perform formal tradeoff studies and utility-cost/effectiveness analyses. During this effort HQ AFSC monitors and provides guidance and support under the cognizance of the HQ AFSC project officer. HQ USAF monitors the AFSC activity and establishes the plans for USAF advocacy of the program by considering the proposed system in structuring future forces, future budgets and information provided to the Secretary of Air Force (SAF) and OSD. A draft DCP outline is prepared by OSD and provided to the Air Force for use in preparing the DCP. The DCP serves two purposes: (1) it represents an OSD staff coordinated position; and (2) it becomes the major program contract document between SECDEF and Air Force. The AFSC Program Manager prepares supporting

documentation which will be used by AFSC in preparation of the DCP. If deemed appropriate by the Commander, AFSC a Joint Operational and Technical Review (JOTR) will be convened to develop additional inputs for the DCP. The JOTR provides representation from AFSC, AFLC and the operating commands. Once all the inputs and supporting data is assembled, HQ USAF integrates it into the draft DCP. The draft DCP is reviewed and signed by the SAF and submitted to OSD and becomes the Air Force request for a decision on the proposed program. This then results in a DSARC I.

The Navy approach is not quite as complicated as the Air Force. The first step is the generation of a draft Operational Requirement (OR). The draft OR is submitted to the CNO Executive Board (CEB) or its subpanel the Acquisition Review Council (ARC) for approval. Each OR is limited to three pages and includes a description of the operational need, operational concept, performance goals, desired fleet introduction date and related efforts. The approved OR is a request to the Chief of Naval Material (CNM) to prepare and submit a Development Proposal (DP). The DP presents the results of technical studies and lays out alternative solutions to the given problem. The DP elements are prepared by the Naval Materiel Command (NAVMAT) the Bureaus and industry. The competing solutions submitted to CNM by interested agencies are aggregated into a single DP thus providing to OPNAV the information necessary to make operational and cost effectiveness comparisons. In response to the DP, OPNAV generates a Naval Development Concept Paper (NDCP) which is the basic Navy program approval and control document. For CNO and SECNAV designated programs (i.e., non DSARC) the NDCP is the final document; it is reviewed by the CEB/ARC and upon approval of the CNO allows commencement of the validation phase. For DSARC level programs a DCP is prepared

based on the NDCP. The DCP is reviewed by the CEB/ARC and the SECNAV prior to submission to OSD. This submission leads to DSARC I.

The Army system starts with an activity called Materiel Concept Investigation. The materiel concept investigation can be initiated by the materiel developer (usually DARCOM) as a result of technology advancement or by the combat developer (usually TRADOC) in response to a recognized threat or deficiency. This activity includes identification of the Operational Capability Objective (OCO), establishment of capability goals, establishment of the operational concept and allows a focusing of R&D efforts to improve the technology base. When the materiel concept investigation has been completed, a Letter of Agreement (LOA) is jointly prepared and authenticated by the materiel developer and the combat developer which establishes that they agree that a materiel concept has sufficient interest, importance and operational and technical potential to warrant the commitment of advanced development resources. The LOA describes further testing and evaluation needed to develop and validate the concept. LOA's which project advanced development costs greater than $10 million are submitted to HQ, DA for approval, the others are approved by the materiel developer and forwarded to HQ, DA for information. Subsequent to the LOA a Special Task Force (STF) or a Special Study Group (SSG) may be formed to carry through with the system. The STF operates under the General Staff supervision of the Dep. Chief of Staff for Operations and Plans (DCSOPS). In support of the STF or SSG, a logistics support planning activity is initiated early in the program to answer the logistics and support questions raised in the LOA. The results of this planning will be included in the DCP/DPM/APM. Also in coordination with the materiel develper, the combat developer and the logistician, the

training activity will be developing training planning. Early in the investigations the Organizational and Operational Concepts must be established through studies and trade offs such that they can be included in the overall force structure of the Army. Also during this investigation phase the materiel developer will be establishing a Baseline Cost Estimate. At the conclusion of the investigation phase a Concept Formulation Package (CFP) is jointly prepared by a STF or SSG, if one was formed. The CFP contains the Trade-off Determination (TOD), the Trade-off Analysis (TOA), the Best Technical Approval (BTA) and Cost and Operational Effectiveness Analysis (COEA). Also at this time draft DCP/DPM/APM's are prepared and staffed with all interested agencies. The next step is preparation of the Outline Development Plan (ODP). Usually the program manager designee has been selected at this time and he prepares the ODP with support from the Operational Test, Combat Developer, Training and Logistics activities. The ODP contains the system concepts agreed upon by the materiel and combat developers. The ODP includes the CFP, the organizational and operational concepts, and force level guidance in appropriate detail. Also included are plans for operational testing, logistics support and training. For systems requiring DSARC or ASARC the draft DCP/DPM/APM will be updated by Dep Chief of Staff for Research, Development and Acquisition (DCSRDA) and becomes the Army draft DCP/APM/APM. For ASARC systems an Independent Parametric Cost Estimate (IPCE) is developed by the Comptroller of the Army (COA) or jointly by the materiel developer and the COA. At this point the Army draft DCP/DPM/APM is submitted to ASARC; for Army designated programs approval of the APM initiates the validation program. For DSARC or DDR&E designated programs, the ASARC and the Secretary of the Army approve the Army draft DCP/DPM for submission to OSD either for DSARC I or DDR&E approval of the DPM.

LESSON I

OUTLINE

OVERVIEW OF C/SCSC

I. DOD Policies, Directives & Instructions

   A. Objectives of C/SCSC (DODI 7000.2)

   B. Applicability (DODD 5000.1, DODI 7000.2)

   C. Policy & Procedures (DODI 7000.2)

   D. Interrelationships (DODD 5000.1, DODI 7000.2, 7000.3, 7000.10)

II. Cost/Schedule Control System Criteria

   A. Information Requirements

   B. Criteria Categories

III. Organization

IV. Planning & Budgeting

V. Accounting

VI. Analysis

VII. Revisions

VIII. CFSR & C/SSR

SYNOPSIS

OVERVIEW OF C/SCSC

This lesson block is intended to give an overview of Cost/Schedule Control System Criteria from a program management standpoint. It will outline the objective of C/SCSC and provide a brief description of the criteria categories, however, it does not constitute an instruction in the subject matter from a cost/schedule measurement or evaluation point of view.

The first, and probably most important point to be made is that C/SCSC is not a specific cost and schedule control system but rather is a set of criteria by which a contractor's cost and schedule control system is judged for adequacy. A corollary to this point is that C/SCSC per se imposes no data item requirements; it is incumbent upon the procuring activity to specify the types and quantity and level of detail of data in the Contract Data Requirements List in each individual contract. In essence C/SCSC (via validation of the contractor) merely assures that the contractor has an adequate management control system. The question "does C/SCSC cost additional money when imposed on a contract?" will not be treated herein as that is beyond the scope of this lesson block and probably will never be answered adequately for all sides.

There are four specific objectives of the criteria which the contractor's system must provide:

1. Indicate work that is in progress
2. Properly relate cost, schedule and technical performance (it

should be noted that although technical performance is stated in DODI 7000.2 specifically, to date no adequate measure of technical performance has been developed for inclusion in a cost and schedule control system and this part of the stated objectives is essentially being ignored).

3. The data provided by the system is valid, timely and auditable.

4. The system provides a practical level of summarization.

The governing DOD instruction (DODI 7000.2) imposes C/SCSC on all programs that meet the DSARC thresholds. It also defines the policies and procedures which were used in developing the 35 criteria included in C/SCSC. The first policy was that minimum changes be imposed on existing contractor cost and schedule control systems. The second was that there should be a single system that is used both for control by the contractor and monitoring by the government (i.e. no double bookkeeping). Third the criteria was to avoid imposition of specific systems; they were to impose requirements. And finally the procedures for validating the contractor's system to C/SCSC were to avoid the proliferation of demands for demonstration systems.

The C/SCSC interelate with other program management policies established at the OSD level. The top directive in program management is DODD 5000.1 which establishes the general policy for program management, defines major programs and establishes a requirement (albeit conceptual) for cost and schedule controls. DODI 7000.2 responds to the requirement for cost and schedule controls by establishing the requirements for C/SCSC which are specifically defined in the "C/SCSC Joint Implementation Guide (AFSCP 173-5,

AFLCP 173-5, AMCP 37-5, NAVMAT P5240). Then DODI 7000.10 establishes the requirements for the Cost Performance Report (CPR) which, if required by the CDRL, provides the monitoring data resulting from the contractor's system to the procuring activity. And finally to close the loop DODI 7000.3 establishes the requirement for the Selected Acquisition Report (SAR) which is prepared by the procuring activity for submission to the upper levels of DOD and to Congress to report on cost, schedule and technical performance.

In order to satisfy C/SCSC, the contractor's system must provide specific information requirements and must be in accordance with 35 criteria which can be grouped into six categories. The information requirements state that the system must provide the following data:

1. Budgeted Cost for Work Scheduled (BCWS)
2. Budgeted Cost for Work Performed (BCWP)
3. Actual Cost for Work Performed (ACWP)
4. Estimated Cost at Completion (EAC)
5. Budgeted Cost at Completion
6. Cost and Schedule Variances with explanations
7. Traceability

The specific criteria fall into the following categories:

A. Organization-these criteria require that the contractual effort be defined and that responsibilities for each item of work be assigned. Specifically a Work Breakdown Structure must be used. At the lowest element of the WBS the work must be broken either into Work Packages, Level of Effort or Apportioned Effort. The work

packages must be defineable entities of work of relatively short duration and organizational responsibility must be identified. Another aspect of the organization criteria is that there must be a systematic integration of the subsystems from master ledger and master schedule down to the individual work packages.

B. Planning and Budgeting-These criteria require that the system must provide for planning, budgeting and authorizing work. To satisfy this category of criteria the work package must be considered the building block wherein each work package defines the work to be accomplished, the budget for the work and the schedule. No specific scheduling techniques (such as PERT, networks, Gantt charts, etc.) are specified, only the requirement that the schedules flow down (with traceability) from the master program schedule to the individual work packages.

C. Accounting-These criteria establish the requirements relating to the methods used to accumulate costs. The direct costs must be accumulated directly to cost accounts which correspond to the WBS and are then summarized upward. Indirect costs may be accumulated at the level corresponding to the level selected by management where indirect costs are to be controlled. The accounting system must be subject to audit by DCAA. The accounting system used for material costs must differentiate between costs of ordered goods, costs of received goods and costs of utilized goods. Finally the accounting system must provide the BCWS, BCWP and ACWP for all cost elements

with summaries at the contractual control level.

D. Analysis-These criteria relate to the analysis of the data provided by the accounting. Specifically comparisons of planned versus actuals (cost & schedule) and the analysis as to causes of variances. The variances should be traceable both by WBS element and by functional organization.

E. Revisions-These criteria define the requirements for revisions of the system in response to internally generated and directed changes.

The following procedures may be used when revising or planning efforts:

a. Management reserve may be used to change cost account budgets.

b. Unopened work packages may be replanned within the confines of the cost account.

c. Work and budget (both together) may be transferred between cost accounts.

The following procedures are specifically prohibited:

a. Retroactive changes to budgets or costs of completed work.

b. Transfer of budget or work independent of each other.

c. Rebudgeting of work-in-process packages.

d. Re-opening of closed work packages.

If additional detail is desired the reader is referred to the C/SCSC Joint Implementation Guide which was previously referenced.

As was stated earlier C/SCSC is required (DOD Directive) only on those programs meeting the DSARC criteria. The procuring activity can, of course,

impose C/SCSC on less than DSARC programs. For smaller programs which do not warrant a full C/SCSC system there are two alternative requirements. For programs greater than $2 million but less than DSARC, the Cost/Schedule Status Report (C/SSR) must be provided. For programs greater than $500,000 the Cost Funds Status Report (CFSR) must be provided. Both of these reports (plus the CPR) are defined in DOD Instruction 7000.10. The CFSR and C/SSR do not require that the contractor be validated to C/SCSC nor do they impose specific management system requirements, they are just data requirements.

LESSON J

OUTLINE

OTHER DOD-CONTRACTOR INTERFACES

I. Contract Administration & Audit

- A. D.C.A.S.-Defense Contract Administration Service
- B. Plant Reps (AFPRO, NAVPRO)
- C. DCAA-Defense Contract Audit Agency

II. Contractor Claims

- A. GAO-Government Accounting Office
- B. ASBCA-Armed Services Board of Contract Appeals

SYNOPSIS

OTHER DOD-CONTRACTOR INTERFACES

This lesson block is intended to describe the agencies involved in formal government to contractor interfaces in addition to the program management office. The description of these agencies is split into two categories: those agencies involved in contract administration and audit; and these agencies involved with contractor claims against the government.

The principle agency involved in contract administation is the Defense Contract Administration Service (DCAS). DCAS is a part of the Defense Supply Agency which reports to OSD equivalently to the military services. By having DCAS in DSA it is not aligned with any single service and is able to support all of them. There are six primary functions performed by DCAS:

1. Contract Administration-The Administrative Contracting Officer (ACO) is the principle government agent at the point of contract performance.
2. Quality Assurance-This involves the quality of the product, the contractors quality procedures and includes the authorization for payment to contractor upon delivery (signing DD250).
3. Production-This provides the ACO and PCO visibliity on contractor production capability and hardware delivery.
4. Systems and Financial Management-This function is provided at the DCAS regional offices and provides a focal point for all DCAS automatic data processing operations, operational accounting and reporting.

5. Industrial Security-The Directorate of Industrial Security within DCAS administers the Defense Industrial Security Program, the Defense Industrial Facilities Protection Program, and the Arms, Ammunition and Explosives Safeguarding Inspection Program.

6. Contractors Employment Compliance-This assures compliance with EEO and any other employment provisions included in contract.

At selected major defense contractor plants the services have elected to provide on site plant representatives to perform the contract administration duties. Currently there are about 40 to 50 plant representative offices throughout the country. For brevity the following discussion concerns the Air Force Plant Representative Office (AFPRO) however, the general mission and policies are equally applicable to the Navy and Army representatives. The mission and duties of the AFPRO are almost identical to those of the DCAS since they provide the same function. However, in addition to straight contract administration duties the AFPRO can also function as an arm of the SPO if that role is delegated to him by the SPO. In this manner the AFPRO can get involved in technical aspects, configuration management and overall surveillance of the contractor's efforts to a deeper extent than is required just to administer the contract. The Air Force Contract Management Division (AFCMD), which is the parent organization for AFPROs, has also established a set of Management Indicators which are used to assess the management performance of the contractor during performance. The indicators are too numerous to go into, but the general categories include engineering management, production management, quality assurance, flight operations, safety, and contract administration.

The third agency involved in the contract aspects is the Defense Contract Audit Agency (DCAA) which as its name implies is concerned with auditing of contractors financial records. Organizationally the Director of DCAA is directly responsible to the SECDEF with administrative supervision provided by the ASD-Comptroller. The primary function of DCAA is to perform all necessary contract audit for DOD and provide accounting and financial advisory service regarding contracts to all DOD components. DCAA gets involved in auditing contractor proposals during the source selection process, auditing the contractor's records post award to verify compliance to the Truth in Negotiations law (PL 87-653) and during the performance of the contract whenever determination of allowable costs is required. In addition DCAA reviews the contractor's financial management systems for adequacy and conformance to Cost Accounting Standards Board rules, regulations and standards.

As indicated earlier the second category of agencies to be discussed are those concerned with contractor claims against the government. This category can be further dissected to those claims or protests relating to the award of a contract and those claims relating to the performance of the contract. In the first case the protest is filed with the Government Accounting Office (GAO) after attempts with the procuring activity have failed. One question which arises here is "Why the GAO?"-its a congressionally established office not within the DOD. The answer is threefold (1) the GAO is statutorily obligated to report illegal expenditures and contracts to Congress, (2) it has a statutory duty to audit and settle public accounts and determine the legality of contract expenditures and therefore the legality of the contract, and (3) the GAO is

obligated to assure that the laws and regulations relating to expeniture of public funds are being complied with. The GAO decisions are final and conclusive on the contracting agency. When deciding on a protest the GAO does not direct the award to a specific bidder, it either prohibits any award from being made (e.g. a defective solicitation) or it can cancel an award to a specific bidder which reopens the source selection process. The procedures for filing a protest are defined in federal statutes and the average protest cycle takes about 90 days from filing to decision

The second agency involved with contractor claims is the Armed Services Board of Contract Appeals (ASBCA) which is one of several contract appeals boards set up throughout the federal government. The board members are appointed by unanimous nomination of the Ass't Secretaries of the military services for Installations and Logistics and the appointments are for indefinite terms. An appeal is made when during a performance of the contract, the contractor makes a claim to the contracting officer for a change and the contracting officer decides to disallow the claim. The process is a complex one and is very similiar to a court trial. On simple straight forward claims, the process is capable of providing a decision in as short as six months but, large complex claims can take several years. If the decision of the ASBCA is not considered satisfactory or acceptable the contractor can appeal to the Court of Claims.