DEFENSE ACQUISITION UNIVERSITY

INTRODUCTION TO DEFENSE ACQUISITION MANAGEMENT

SEPTEMBER 2005

PUBLISHED BY
DEFENSE ACQUISITION UNIVERSITY PRESS
FORT BELVOIR, VA 22060-5565

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SEVENTH EDITION

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PUBLISHED BY THE
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FORT BELVOIR, VIRGINIA

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20401-9328
ISBN 0-16-072776-6

PREFACE

This seventh edition of *Introduction to Defense Acquisition Management* provides an update of the regulatory framework from Department of Defense Directive 5000.1 and Department of Defense Instruction 5000.2 governing the defense acquisition system. In addition, information about the Joint Capabilities Integration and Development System from the May 2005 Chairman of the Joint Chiefs of Staff Instruction 3170.01E, and information about the relatively new Department of Defense Planning, Programming, Budgeting and Execution (PPBE) process are also provided.

This guidebook is designed to be both a comprehensive introduction to the world of defense systems acquisition management for the newcomer, and a summary-level refresher for the practitioner who has been away from the business for a few years. It focuses on Department of Defense-wide management policies and procedures but not on the details of any specific defense system.

This guidebook is based on numerous source documents. For the reader who wishes to dig deeper into this complex area, a list of Uniform Resource Locators (World Wide Web sites) is provided after the last chapter.

Every attempt has been made to minimize acronyms. Commonly used terms are spelled out the first time they are used in each chapter. More difficult, or rarely used terms, are spelled out each time for ease of reading.

We encourage your suggestions and comments. A postage-paid Customer Feedback form is provided at the back of this guidebook for your convenience. Please take a few minutes to fill it out and help us improve our publication.

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ACKNOWLEDGMENTS

The authors appreciate the comments of interested readers and Defense Acquisition University faculty in providing suggestions for this seventh edition of *Introduction to Defense Acquisition Management.* We would also like to offer special thanks to the following individuals of the DAU Visual Arts and Press: Collie Johnson for her expert editing and proofreading; Debbie Gonzalez for her efforts in final preparation of this guidebook; and SPC Kelly Bailey, USA, for her striking cover design.

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1

BASICS

A basic understanding of the Department of Defense (DoD) acquisition system begins with the following overview:

> *The Defense Acquisition System exists to manage the nation's investments in technologies, programs, and product support necessary to achieve the National Security Strategy and support the United States Armed Forces. The investment strategy of the Department of Defense shall be postured to support not only today's force, but also the next force, and future forces beyond that. The primary objective of Defense acquisition is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price. (DoD Directive 5000.1)*

Definitions

Acquisition includes design, engineering, test and evaluation, production, and operations and support of defense systems. As used herein, the term "defense acquisition" generally applies only to weapons and related items, such as military cargo trucks, and information technology systems, processes, procedures, services, and end products. The word *procurement*, which is the act of buying goods and services for the Government, is often (and mistakenly) considered synonymous with acquisition; it is, instead, but one of the many functions performed as part of the acquisition process. For example, non-weapon and non-information technology items required by the DoD, such as passenger vehicles, office supplies, and waste removal are "procured"; they are not subject to the full range of functions inherent in the acquisition process of weapons and information technology systems and thus, are not described in this publication.

An *Acquisition Program* is a directed, funded effort that provides a new, improved, or continuing materiel,[1] weapon or information system or service capability in response to an approved need.

A *weapon system* is an item that can be used directly by the Armed Forces to carry out combat missions.

Information Technology systems include both *National Security Systems* and *Automated Information Systems*. National security systems used for intelligence and cryptologic activities and command and control of military forces, are integral to a weapons system, or critical to the direct fulfillment of a military or intelligence mission. Automated information systems are usually associated with the performance of routine administrative and business tasks such as payroll and accounting functions.

Management includes a set of tasks required to accomplish a specified project. One way of looking at systems acquisition management is by looking at individual elements that comprise each of these terms as noted below:

System	Acquisition	Management
• Hardware • Software • Logistics Support — Manuals — Facilities — Personnel — Training — Spares	• Design and develop system • Test • Produce • Field • Support • Improve or replace • Dispose of	• Plan • Organize • Staff • Control • Lead

The *program manager* is the individual within the DoD chartered to manage an acquisition program. The program manager has no other command or staff responsibilities. Chapter 2 provides more insight on program management.

[1] *Materiel* is a generic word for equipment. It is inherently plural. It is distinguished from material, which is what things are made of. Material can be singular or plural. For example, aircraft are materiel; the materials aircraft are made of include aluminum, steel, and titanium.

The Role of the Executive Branch, the Congress, and Industry in Defense Acquisition

At the national level, three major top-level participants in defense acquisition include the Executive Branch, the Congress, and defense industry. The perspectives, responsibilities, and objectives of these participants are summarized in this chapter.

Executive Branch

Major participants who have significant impact on defense acquisition programs within the Executive Branch include the President, the Office of Management and Budget, the National Security Council, and the Department of Defense (DoD). The chart below characterizes the perspectives, responsibilities, and objectives of the Executive Branch. Chapter 5 contains a more detailed discussion of organizations and positions below this top level.

Perspectives	Responsibilities	Objectives
• Formulate, direct and execute national security policy • Patriotism • Personal ambition • Reelection	• Sign legislation into law (President) • Commander-in-Chief (President) • Negotiate with Congress • Make decisions on major Defense acquisition programs (the Under Secretary of Defense (Acquisition, Technology and Logistics)) • Issue directives/regulations • Contract with industry	• Satisfy national security objectives • Maintain a balanced force structure • Field weapon systems to defeat threats to national security • Prevent undue congressional interest/scrutiny • Eliminate fraud, waste, and abuse in federal procurement

The Congress

The Legislative Branch (Congress) includes the two committees that authorize defense programs, the Senate Armed Services Committee and the House Armed Services Committee; the two committees that appropriate dollars for defense programs, the House Appropriations Committee and Senate Appropriations Committee; the two committees that set spending limits for national defense, the Senate and House Budget Committees; various committees having legislative oversight of defense activities;

individual members of the Congress; the Congressional Budget Office; and the Government Accountability Office. The chart below characterizes the perspectives, responsibilities, and objectives of the Legislative Branch (Congress):

Perspectives	Responsibilities	Objectives
• Constituent interests • Two-party system • Checks and balances • Patriotism • Personal ambition • Reelection	• Conduct hearings • Raise revenue; allocate funds • Pass legislation • Oversight and review	• Balanced national security and social needs • Distribute federal dollars by district/state • Maximize competition • Control industry profits • Control fraud, waste, and abuse

Defense Industry

Industry (contractors) includes large and small organizations (both U.S. and foreign) providing goods and services to the DoD. The chart below characterizes the perspectives, responsibilities, and objectives of the Defense Industry:

Perspectives	Responsibilities	Objectives
• Stockholder's interests • Capitalism • Patriotism	• Respond to solicitations • Propose solutions • Conduct independent research and development • Design, produce, support, and upgrade defense systems	• Profit and growth • Cash flow • Market share • Stability • Technological achievement

Numerous external factors impact and help shape every acquisition program, creating an environment over which no single person has complete control. These factors include policies, decisions, reactions, emergencies, the media, public sentiment, emotions, world opinion, and the ever present (and changing) threats to national security. Often these factors work at opposite purposes. Understanding and dealing with the environment they create is one of the greatest challenges for defense program managers. Figure 1-1 illustrates some of the interrelationships among these key players. This figure also shows the program manager in the middle of a complex triangle of relationships, faced with the challenge of

managing a defense acquisition program in the midst of many significant, diverse, and often competing interests.

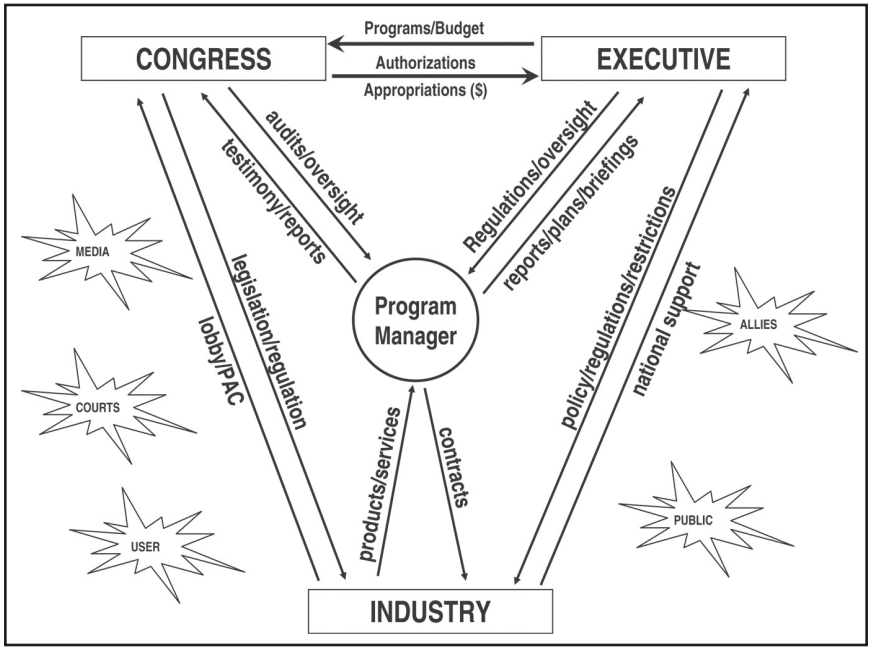

Figure 1-1. The Program Manager's Environment

Successful Defense Acquisition Program

A successful defense acquisition program places a capable and supportable system in the hands of a user (the warfighter or those that support the warfighter) when and where it is needed, at an affordable price. The ideal outcome necessary for successful long-term relationships among the participants in defense acquisition is "Win-Win," wherein each participant gains something of value for participating. Depending on your perspective, "success" can take many different forms.

- For the *Program Manager*, success means a system that is delivered on time, within cost, and meeting the warfighter's requirements.

- For the *Office of the Secretary of Defense*, success means a program that satisfies national security objectives, provides a balanced force structure, and does not attract undue congressional scrutiny.

- For the *Congress*, success means a system that strikes a balance between defense and social needs, and provides a fair distribution of defense dollars by state/district.

- For *industry*, success means a program that provides a positive cash flow, offers a satisfactory return on investment, and preserves the contractor's competitive position in the industry.

- For the *warfighter*, success means a system that is effective in combat and easy to operate and maintain.

Authority for Defense Acquisition

The authority for DoD to conduct defense acquisition, i.e., to develop, produce, and field weapons and information technology systems, flows from two principal sources: public law (legal basis) and executive direction. Executive direction flows from the authority of the President and the Federal Government's executive agencies to issue orders and regulations to both enforce and facilitate the law and to help carry out the constitutional duties of the executive branch.

Public Law

Statutory authority from the Congress provides the legal basis for systems acquisition. Some of the most prominent laws impacting the acquisition process follow:

- *Small Business Act* (1963), as amended

- *Office of Federal Procurement Policy Act* (1983), as amended

- *Competition in Contracting Act* (1984)

- *Department of Defense Procurement Reform Act* (1985)

- *Department of Defense Reorganization Act of 1986* (Goldwater-Nichols)

- *Government Performance and Results Act* (1993)

- *Federal Acquisition Streamlining Act of 1994*

- *Annual authorization and appropriations legislation.* Annual authorization and appropriations legislation may contain substantial new or amended statutory requirements (like the Clinger-Cohen Act of 1996)

The United States Code is the codification by subject matter of the general and permanent laws of the United States. It is divided by broad subjects into 50 Titles. Most provisions of the laws listed above have been codified in Title 10, United States Code, *Armed Forces*.

Executive Direction

Authority and guidance also come from the Executive Branch in the form of executive orders and national security decision directives issued by the President and other agency regulations. Executive direction is the rule-making power of the President. In some cases, legislation specifically lays out the President's authority; in other cases, it is implied by virtue of the President's position as head of the executive branch of government. Examples of executive direction follow:

- *Executive Order 12352* (1982) directed procurement reforms and establishment of the Federal Acquisition Regulation (FAR).

- *Federal Acquisition Regulation* (1984) provided uniform policies and procedures for the procurement of all goods and services by executive agencies of the Federal Government. Additional guidance for defense acquisition programs is provided in the DoD Federal Acquisition Regulation Supplement (DFARS).

- *National Security Decision Directive 219* (1986) directed implementation of recommendations of the President's Blue Ribbon Commission on Defense Management.

- *Executive Order 13101* (1998) implemented the provisions of the Resource Conservation and Recovery Act to ensure federal agency use of environmentally preferable products and services, and directed the use of cost-effective procurement preference programs (sometimes called "green procurement") favoring the purchase of these products and services.

- *Office of Management and Budget Circular A-11* describes the process for preparation and submission of budget estimates; strategic plans; annual performance plans; and the planning, budgeting, and acquisition of capital assets for all executive departments.

2

THE ACQUISITION ENVIRONMENT

Transformation of the Department of Defense

The war on terrorism has taught us that future threats to our national security may come from many diverse areas—domestic and international terrorists, computer hackers, state-sponsored subnational groups, nation-states, and others.

To help prepare for an uncertain and dangerous future, the *Transformation Planning Guidance*[2] for the Department provides a strategy for transforming "how we fight, how we do business, and how we work with others." The guidance provides the strategic imperative for transformation:

> *Transformation is necessary to ensure U.S. forces continue to operate from a position of overwhelming military advantage in support of strategic objectives. We cannot afford to react to threats slowly or have large forces tied down for lengthy periods. Our strategy requires transformed forces that can take action from a forward position and, rapidly reinforced from other areas, defeat adversaries swiftly and decisively while conducting an active defense of U.S. territory.*

Transforming How We Fight. Transforming how we fight hinges on the development of future joint warfighting concepts and includes the full range of military capability areas: Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF). Chapter 6, Joint Capabilities Integration and Development System, addresses the role of the acquisition workforce in DOTMLPF, specifically the acquisition of defense systems for the *materiel* capability area. The focus is on investing in capabilities based on joint operating concepts.

[2] *Transformation Planning Guidance*, Secretary of Defense Donald H. Rumsfeld, April 2003.

Transforming How We Do Business. A priority for the transformation of the Department is the streamlining of the acquisition process. Acquisition policies and procedures, summarized in Chapters 4 and 6, provide insight on the implementation of evolutionary acquisition and spiral development to reduce cycle time and field an initial increment of warfighting capability as fast as possible. The Department has also aligned the acquisition process with a new capabilities-based resource allocation process (see Chapter 8).

Most of the transformation tasks outlined in the Transformation Planning Guidance will impact on the acquisition of defense systems in many ways. Some of these tasks are listed below:

- *Concept Development and Experimentation Programs* were established by the combatant commands and the military services to conduct experiments to evaluate new joint operating concepts.

- *Transformation Research, Development, Test and Evaluation*. The Department will initiate Research, Development, Test and Evaluation programs with "greater flexibility and rapidity."

- *Joint Rapid Acquisition Programs*. These initiatives are envisioned to grow out of the coevolution of joint operating concepts and technologies in activities such as Joint Warfare Experiments, Advanced Technology Demonstrations, and Advanced Concept Technology Demonstrations. Acquisition would be started in the current year with bridge funds to the Planning, Programming, Budgeting and Execution process to accelerate the initiatives.

- *Transformation of Test and Evaluation*: Joint test and evaluation is needed to determine if the integrated architectures that define the parameters of a joint warfighting capability do in fact result in a viable application of those capabilities.

Transforming How We Work With Others. The defense acquisition process must support arrangements for international military cooperation so that U.S. warfighting capabilities can be applied effectively with the capabilities of our allied and coalition partners.

Revolution in Military Affairs

Many defense analysts believe the conduct of warfare is entering a period of fundamental change, literally a "revolution in military affairs," driven by advances in information technology and precision guided weapons. Past experience suggests that revolutions in military affairs are not produced solely by rapid technological advancements, but also require changes to prevailing operational concepts, doctrine, and force structure to fully harness the technology in a manner that dominates the battlefield. Coupled with the rise of new threats since the end of the Cold War (international drug cartels, terrorism, regional warfare, chemical/biological agents, availability of missile technology, etc.), the United States has begun the process of transforming its forces to harness the revolution in military affairs, both to meet these new threats and to ensure it remains dominant on any 21st Century battlefield.

Full Spectrum Dominance

Full spectrum dominance is to be achieved through the interdependent application of four operational concepts: dominant maneuver, precision engagement, focused logistics, and full-dimensional protection. Together, these four concepts provide joint warfighters the means to fulfill their primary purpose—victory in war, as well as the capability to dominate an opponent across the full-range of military operations. Achieving full spectrum dominance also means building an integrated, complex set of systems, especially a command, control, communications, computers, intelligence, surveillance and reconnaissance architecture (see Chapter 5). The challenge of research, development, and acquisition of future Defense systems will be to meet the challenge of achieving full spectrum dominance.

Acquisition Streamlining Initiatives

There have been many attempts to reform the Federal Government's acquisition process over time. However, in the early 1990s it became clear that the rapidly changing threat environment, reduced resources, and changes in technology development required permanent changes in the way DoD acquired defense systems.

Perhaps the most notable changes in defense systems acquisition were caused by the collapse of the Soviet Union and the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001. These

major world events impacted national objectives, treaties, budgets, and alliances. The specter of strategic thermonuclear war lessened while the probability of regional conflicts and policing actions increased. Domestic terrorism, information warfare, and narcotics control are becoming increasingly troublesome threats to national security, and the Department is playing an ever-increasing role in confronting these issues.

The defense industrial base has gone through a metamorphosis. Weaker competitors have merged with stronger companies or have dropped out of the market. The remaining large contractors are positioning themselves with other major contractors to compete for the remaining defense contracts. For example, in 1982 there were 10 major U.S. producers of fixed-wing military aircraft. By 1998, there were only three: Boeing, Lockheed-Martin, and Northrop-Grumman. As a result of this reduced industrial base, the Department is working to bring about greater civilian/military industrial integration.

Given the changes in the threat and the fast pace of technological advances in the commercial market, there existed a real need for access to technology before potential adversaries could buy it. Therefore, the Department fundamentally changed the way it acquired systems—that is, more efficient and effective ways to acquire goods and services faster, better, and cheaper. This led to the following major "events" that provided the foundation for streamlining the acquisition process:

- *Section 800 Panel Report* (1993). This report was the result of Congressional direction to the Under Secretary of Defense (Acquisition and Technology)[3] to review all DoD procurement laws "with a view toward streamlining the *defense* acquisition process." It recommended over 400 changes to existing laws and regulations. The report was intended not only to implement reforms recommended in several previous studies, but also provide a framework for continuous improvements in acquisition practices.

[3] Established by law in 1986 as the Under Secretary (Acquisition) and by Defense Directive 5134.1, February 10, 1987, this position derived from the Under Secretary of Defense (Research and Engineering) established in 1977. The title changed to Under Secretary of Defense (Acquisition and Technology) in the National Defense Authorization Act of 1994, Public Law 103-160, November 10, 1993. The National Defense Authorization Act for Fiscal Year 2000 (Public Law 106-65) redesignated the Under Secretary of Defense (Acquisition and Technology) as the Under Secretary of Defense (Acquisition, Technology and Logistics (USD[AT&L]).

- *Secretary of Defense Perry's "Acquisition Reform—A Mandate for Change"* (February 1994). This paper lists the key reasons why change in acquisition is imperative and outlines methods to make the most impact through change. This led to the formal beginning of regulatory reform in DoD.

Major legislation, regulatory reform, and a series of implementing initiatives has helped to institutionalize better business practices within the Department of Defense.

Major Legislation

Federal Acquisition Streamlining Act (FASA) 1994. This legislation on procurement reform implemented many of the recommendations of the Section 800 Panel Report. FASA repealed or substantially modified over 225 provisions of law primarily dealing with contracting and procurement matters. Notable features of this legislation include emphasis on the use of commercial versus military specifications, encouragement of electronic commerce, and requirements to use past performance when evaluating contractor proposals.

***The Federal Acquisition Reform Act (FARA)* (1996).** A follow-up to FASA, FARA (Division D of the FY 1996 National Defense Authorization Act) covers some of the Section 800 Panel acquisition reform recommendations that were not covered in FASA. Some of the more interesting issues covered include exceptions for commercial item acquisitions, the Truth in Negotiations Act, and Cost Accounting Standards.

***Information Technology Management Reform Act (ITMRA)* (1996).** ITMRA was enacted as Division E of the FY 1996 National Defense Authorization Act. This act requires greater accountability for system improvements achieved through information technology (IT). Among other things, the act streamlines both protest and acquisition procedures for IT systems by identifying the General Accounting Office (now renamed the Government Accountability Office) as the single agency for protests; and by repealing the Brooks Act, which, since the 1960s, imposed cumbersome regulations on purchasing computers (originally targeted at mainframes). It also addresses the issue of rapidly changing technology by requiring modular contracting with increments delivered within 18 months of contract award. **Note**: FARA and ITMRA are known together as the "Clinger-Cohen Act" in honor of their congressional sponsors.

Regulatory Reform

Provisions of the Federal Acquisition Streamlining Act, the Clinger-Cohen Act, and recommendations of the various process action teams convened during the 1990s were implemented in changes to the Federal Acquisition Regulation (and its Defense Supplement), and DoD directives, instructions, and regulations for systems acquisition. (The Federal Acquisition Regulation was mentioned in Chapter 1; regulatory provisions will be covered in Chapter 4).

Implementing Initiatives

Implementing initiatives must work together to support objectives of acquiring defense systems better, faster, and cheaper. The following are not all-inclusive, but capture the essence of the major thrusts of acquisition streamlining within the DoD.

Alternative Dispute Resolution. To facilitate resolution of differences between the government and its contractors without going into a formal protest or litigation process, alternative dispute resolution provides voluntary procedures to resolve issues in controversy. These procedures may include, but are not limited to, conciliation, facilitation, mediation, fact finding, arbitration, and use of ombudsmen.

Advanced Concept Technology Demonstrations. To provide opportunities to try out mature technology directly with the warfighters, advanced concept technology demonstrations allow operational forces to experiment with new technology in the field to evaluate potential changes to doctrine, operational concepts, tactics, modernization plans, and training. Following a successful advanced concept technology demonstration, the system may enter the acquisition process at whatever point good judgment dictates.

Best Value Contracting. DoD seeks to award contracts based on the best overall value. This means that the Department considers all relevant factors, such as cost, performance, quality, and schedule, and makes potential tradeoffs between cost and non-cost factors, rather than just buying from the lowest cost, technically acceptable offeror.

Commercial Items and Practices. Maximizing the use of commercial items takes advantage of the innovation offered by the commercial

marketplace and ensures access to the latest technology and a broader vendor base. DoD is also encouraging defense contractors to move to commercial practices that will enhance their global competitiveness. The Department's goal is to establish partnerships with industry to create advanced products and systems with common technological bases and to allow production of low-volume, defense-unique items on the same lines with high-volume commercial items.

Evolutionary Acquisition is the preferred strategy for rapid acquisition of mature technology for the user. An evolutionary approach delivers capability in militarily useful increments, recognizing up front the need for future capability improvements. The objective is to balance needs and available capability with resources and to put capability into the hands of the user quickly.

Integrated Product Teams and Integrated Product and Process Development are two closely intertwined initiatives that are replacing traditionally adversarial relationships among key players (users, acquirers, testers, funds managers, contractors, and other stakeholders) with cooperation and teamwork to improve product quality and supportability.

Logistics Transformation will transform DoD's mass logistics system to a highly agile, reliable system that delivers logistics on demand. Logistics reform will move toward performance based support and link modern warfighting and modern business practices. The commercial marketplace demonstrates that product support can be optimized to create a strategic advantage by focusing on customer service, integrated supply chains, rapid transportation, and electronic commerce. When applied to defense, this equates to integrated logistics chains focused on readiness and rapid service to the warfighter.

Open Systems**.** Designing open systems and specifying interface standards enhance interoperability, both among the Services and with our allies. Applying widely used interface standards in weapons systems will enable multiple sources of supply and technology insertion and allow for upgrading through spares.

Price or Cost as An Independent Variable is used to develop strategies for acquiring and operating affordable systems by setting aggressive, achievable price or cost objectives and managing achievement of these objectives. Through participation on cost performance integrated

product teams, key stakeholders (users, industry, etc.) help set and achieve cost objectives by identifying potential tradeoffs early in the acquisition process. Price is preferred over cost as the independent variable when there is a high degree of competition, high confidence the price is fair and reasonable, and the technical risk is acceptable.

Performance-based Services Acquisition. As services become an increasingly significant element of what DoD buys, steps are being taken to ensure they are acquired effectively and efficiently. Service requirements must be stated using results required, and not methods for performance of the work.

Specifications and Standards Reform. In mid-1994, Secretary of Defense Perry approved a new major policy for use of specifications and standards for defense systems acquisition contracts. First choice is the use of performance specifications. Initially, design-specific specifications and standards were authorized only as a last resort, and their use required a waiver. This policy was revised in 2005 to allow specs and standards as contract requirements without the need to obtain a waiver.

There are many more initiatives in place, as well as new ones being tested throughout the Department. These initiatives will help America acquire quality defense systems faster and cheaper—essential if this country is to maintain the world's best warfighting forces. The cultural shifts in the acquisition process may be characterized by the following chart:

Changes in Emphasis

Characteristics of Defense Systems Acquisition in the past included:	Today the emphasis has shifted toward:
• Many new systems	• Fewer new systems; modified legacy systems
• Focus on nuclear warfare	• Conventional/asymmetrical warfare
• Technology-driven systems	• Affordability-driven systems
• Service-specific programs	• Joint programs
• Military-unique technology	• Commercial and dual-use technology
• Technology development	• Technology insertion

3

PROGRAM MANAGEMENT IN DEFENSE ACQUISITION

Program Manager

Department of Defense (DoD) policy requires that a *program manager* be designated for each acquisition program. The role of the program manager[4] is to direct the development, production, and initial deployment (as a minimum) of a new defense system. This must be done within limits of cost, schedule, and performance, as approved by the program manager's acquisition executive (see Chapter 5). The program manager's role, then, is to be the agent of the military service or defense agency in the defense acquisition system to ensure the warfighter's modernization requirements are met efficiently and effectively in the shortest possible time.

> *The designated individual with responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs. The Program Manager shall be accountable for credible cost, schedule, and performance reporting to the Milestone Decision Authority. (DoDD 5000.1)*

Program Manager's Perspective

The effective program manager should have the "big picture" perspective of the program, including in-depth knowledge of the interrelationships among its elements. An effective program manager:

[4] The title "program manager" is used broadly here. Some DoD Components use different titles. For example, the Army uses "project" and "product" manager depending on the authorized rank of the position.

- is a leader and a manager, not primarily a task "doer";

- understands the requirements, environmental factors, organizations, activities, constraints, risks, and motivations impacting the program;

- knows and is capable of working within the established framework, managerial systems, and processes that provide funding and other decisions for the program to proceed;

- comprehends and puts to use the basic skills of management—planning, organizing, staffing, leading, and controlling—so people and systems harmonize to produce the desired results;

- coordinates the work of defense industry contractors, consultants, in-house engineers and logisticians, contracting officers, and others, whether assigned directly to the program office or supporting it through some form of integrated product team or matrix support arrangement;

- builds support for the program and monitors reactions and perceptions that help or impede progress; and

- serves both the military needs of the user in the field and the priority and funding constraints imposed by managers in the Pentagon and military service/defense agency headquarters.

Program Management

> *The process whereby a single leader exercises centralized authority and responsibility for planning, organizing, staffing, controlling, and leading the combined efforts of participating/assigned civilian and military personnel and organizations, for the management of a specific defense acquisition program or programs, through development, production, deployment, operations, support, and disposal. (DAU Glossary)*

Program management must first take into account diverse interests and points of view. Second, it facilitates tailoring the management system and techniques to the uniqueness of the program. Third, it represents

integration of a complex system of differing but related functional disciplines[5] that must work together to achieve program goals.

Why is Program Management Used in Defense Acquisition?

Program management provides for a single point of contact, the program manager, who is the major force for directing the system through its evolution, including design, development, production, deployment, operations and support, and disposal. The program manager, while perhaps being unable to control the external environment, has management authority over business and technical aspects of a specific program. The program manager has only one responsibility—managing the program—and accountability is clear. Defense industry typically follows a management process similar to that used by DoD. Often contractors will staff and operate their program office to parallel that of the government program they support.

Integrated Product and Process Development

Integrated product and process development is a management process that integrates all activities from the concept of a new defense system through the entire life cycle (see Chapter 7), using multidisciplinary teams, called integrated product teams.

The Program Manager and Integrated Product Teams

An integrated product team is composed of representatives from all appropriate functional disciplines working together with a team leader to facilitate management of acquisition programs. Integrated product teams exist at the oversight and review levels (see Chapter 5), as well as at the program office level. Program office level integrated product teams may be structured around the major design aspects of the system under development, such as an "engine Integrated Product Team," or processes like a "test Integrated Product Team." Following contract award, program level integrated product teams often include contractor participation.

The DoD has recognized the importance of integrated product teams as a means to aid the program manager, and as a way to streamline the decision

[5] Functional disciplines refer to business, cost estimating, and financial management; logistics; systems engineering; information technology; test and evaluation; production, quality, and manufacturing management; contracting; and others that are considered separate career fields.

process. By working as part of cross-functional teams, issues can be identified and resolved more quickly, and stakeholder involvement in the overall success of the program can be maximized. In this way the program manager capitalizes on the strengths of all the stakeholders in the defense acquisition system.

4

DEPARTMENT OF DEFENSE ACQUISITION POLICY

Regulatory Documents

Two major Department of Defense (DoD) regulatory documents guide the management of Defense acquisition:

DoD Directive (DoDD) 5000.1

The Defense Acquisition System, approved by the Deputy Secretary of Defense, provides a basic set of definitions and three overarching policies that govern the Defense acquisition system: flexibility, responsiveness, and innovation. In addition, a minimum set of more detailed policies is provided in a tightly structured format for ease of reading and understanding.

DoD Instruction (DoDI) 5000.2

Operation of the Defense Acquisition System, approved by the Under Secretary of Defense (Acquisition, Technology and Logistics), the Assistant Secretary of Defense (Networks and Information Integration), and the DoD Director, Operational Test and Evaluation, establishes a simplified and flexible management framework for translating mission needs and technological opportunities into stable, affordable, and well-managed acquisition programs. DoDI 5000.2 establishes a general approach for managing all defense acquisition programs, while authorizing the program manager and the Milestone Decision Authority (MDA) to exercise discretion and prudent business judgement to structure a tailored, responsive, and innovative program. The Defense Acquisition University groups oversight of the acquisition process into three primary decision support systems: the Joint Capabilities Integration and Development System (JCIDS), the

Defense Acquisition System, and the Planning, Programming, Budgeting and Execution (PPBE) process. This is depicted in Figure 4-1.

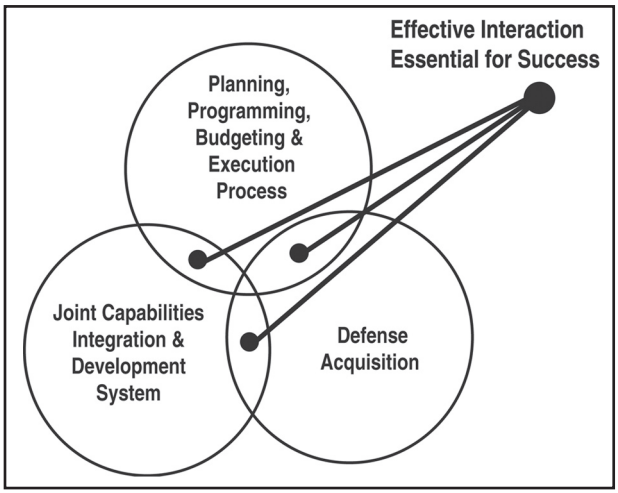

Figure 4-1. Three Major Decision Support Systems

Three Major Decision Support Systems

These three decision support systems must interface on a regular basis to enable the leadership to make informed decisions regarding the best allocation of scarce resources. This guidebook discusses these decision support systems in Chapters 6, 7, and 8, respectively.

The *Joint Capabilities Integration and Development System*, governed by Chairman of the Joint Chiefs of Staff Instruction 3170.01E, is the system that results in identifying and documenting warfighting needs, i.e., mission deficiencies or technological opportunities.

The *Defense Acquisition System*, governed by the DoD 5000 series of regulatory documents, establishes a management framework for translating the needs of the warfighter and technological opportunities into reliable, affordable, and sustainable systems.

The *Planning, Programming, Budgeting and Execution Process*, governed by DoD Directive 7045.14 and DoD Financial Management Regulation 7000.14-R, prescribes the process for making decisions on funding for every element of the Department, including acquisition programs.

Acquisition Categories

For management purposes, all defense acquisition programs fall into one of the Acquisition Categories (ACATs) shown in Figure 4-2. The ACAT level is principally based on their dollar value and level of MDA. The chain of authority and organizational players affecting various ACATs are discussed in Chapter 5.

Major Defense Acquisition Programs	ACAT ID:	• Designated by USD(AT&L) • Defense Acquisition Board Review • Decision by USD(AT&L)	$365M RDT&E or $2.19B Procurement (FY 2000 Constant $)
	ACAT IC:	• Designated by USD(AT&L) • Component-level Review • Decision by Component	
Major Automated Information Systems Acquisition Programs	ACAT IAM:	• Designated by DoD Chief Information Officer • Information Technology Acquisition Board Review • Decision by DoD Chief Information Officer	$378M Life Cycle Cost or $126M Total Prog. Cost or $32M Prog. Cost in any Single Year (FY 2000 Constant $)
	ACAT IAC:	• Designated by DoD Chief Information Officer • Component-level Review • Decision by Component Acquisition Executive	
Major Systems	ACAT II:	• Designated by Component Acquisition Executive • Component-level Review • Decision by Component Acquisition Executive	$140M RDT&E or $660M Procurement (FY 2000 Constant $)
All Other Systems (Except for Army Navy, Marine Corps)	ACAT III:	• Designated IAW Component Policy • Does Not Meet Criteria for ACAT I, IA, II, or III • Review and Decision at Lowest Appropriate Level	No Fiscal Criteria
Army Navy Marine Corps	ACAT IV:	• Designated IAW Component Policy • Does Not Meet Criteria for ACAT I, IA, II, or III • Review and Decision at Lowest Appropriate Level	See AR 70-1 (Army) & SECNAVINST 5000.2C (Navy and Marine Corps)

Figure 4-2. Acquisition Categories

Major Defense Acquisition Programs (MDAP) are ACAT I programs. There are two subcategories of ACAT I programs:

- *ACAT ID.* The MDA is the Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)). The "D" refers to the Defense Acquisition Board. These programs require a review by an Office of the Secretary of Defense Overarching Integrated Product Team and the Defense Acquisition Board. The USD(AT&L) as the Defense Acquisition Executive makes the final decision.

- *ACAT IC*, for which the MDA is the Component[6] Acquisition Executive (CAE). The "C" refers to Component. Each of the components has its own process for headquarters review of these programs prior to a milestone decision by the Component Acquisition Executive.

Major automated information system acquisition programs are ACAT IA programs. There are two subcategories of ACAT IA programs:

- *ACAT IAM*, for which the MDA is the Assistant Secretary of Defense (Networks and Information Integration). The "M" refers to major automated information systems reviewed by the Information Technology Acquisition Board. Final decision authority lies with the assistant secretary who is also the Chief Information Officer (CIO) of the DoD.

- *ACAT IAC*, for which the MDA is delegated to the Component. The "C" refers to Component. After the appropriate headquarters review, the Component Acquisition Executive, advised by the Component CIO, makes the final milestone decision.

ACAT II programs are those programs that do not meet the criteria for an ACAT I program but do meet the criteria for a major system. The MDA for these programs is also the Component Acquisition Executive. The review process for these programs is similar to that of ACAT IC programs.

ACAT III programs are those programs that do not meet the criteria for ACAT I, ACAT IA, or ACAT II. The MDA is designated by the

[6] DoD Components are the military departments (e.g., Department of the Army), defense agencies (e.g., Defense Information Systems Agency), and unified commands (e.g., United States Joint Forces Command). Only one unified command has an acquisition executive, the U.S. Special Operations Command.

Component Acquisition Executive. Milestone decisions for these programs are typically made at the Program Executive Officer or Systems Command (Navy and Marine Corps), Major Subordinate Command (Army), or Product or Air Logistics Center (Air Force) level. This category also includes nonmajor automated information system acquisition programs.

ACAT IV programs have been retained as a designation for internal use by the Department of the Navy (includes Marine Corps programs).

DoD Space Systems Acquisition Process

Management oversight of national security space systems has been delegated to the Under Secretary of the Air Force. National Security Space Acquisition Policy 03-01, October 6, 2003, provides policies and procedures for oversight of space-based systems (satellites), ground-based systems (satellite command and control and other ground stations), satellite launch systems (boosters and space launch facilities), and user equipment. This policy generally parallels that of the DoD 5000 documents mentioned earlier, with slightly different terms and streamlined processes appropriate for high-technology, small-quantity space systems.

Acquisition, Technology and Logistics Knowledge Sharing System

In addition to the regulatory documents mentioned above and throughout this guidebook, the *Acquisition, Technology and Logistics Knowledge Sharing System (AKSS)* can be accessed over the Internet at http://akss.dau.mil. AKSS, with links to acquisition-related communities of practice, various acquisition commands/organizations, and valuable reference material, provides a complete Web-based source of information for the acquisition community.

5

DEFENSE ACQUISITION MANAGEMENT— KEY PERSONNEL AND ORGANIZATIONS

Background

Packard Commission

The President's Blue Ribbon Commission on Defense Management, chaired by former Deputy Secretary of Defense David Packard, conducted a comprehensive review of the overall defense acquisition system. Reporting to President Reagan in early 1986, the Packard Commission recommended creation of a single top-level Defense Acquisition Executive responsible for the defense acquisition process, the Under Secretary of Defense (Acquisition),[7] and establishment of a streamlined reporting chain from program managers of major defense acquisition programs to that top-level executive. President Reagan approved the Commission's recommendations and directed their implementation in National Security Decision Directive 219 on April 1, 1986.

Defense Management Review

A follow-on assessment of defense acquisition management was initiated by President Bush in 1989. The report of the Defense Management Review

[7] Established by law in 1986 as the Under Secretary (Acquisition) and by Defense Directive 5134.1, February 10, 1987, this position derived from the Under Secretary of Defense (Research and Engineering) established in 1977. The title changed to Under Secretary of Defense (Acquisition and Technology) in the National Defense Authorization Act of 1994, Public Law 103-160, November 10, 1993. The National Defense Authorization Act for Fiscal Year 2000 (Public Law 106-65) redesignated the Under Secretary of Defense (Acquisition and Technology) as the Under Secretary of Defense (Acquisition, Technology and Logistics (USD[AT&L]).

reiterated the Packard Commission findings and reinforced the importance of the streamlined reporting chain for all program managers. This reporting chain provides for no more than two levels of management oversight between the program manager and the Milestone Decision Authority (MDA) for all acquisition programs. The reporting chain for any particular program is a function of the program's size and Acquisition Category (ACAT). (See Chapter 4 for a discussion of ACATs.)

This structure provides a clear line of authority running from the Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)), through Component Acquisition Executives and Program Executive Officers, to the individual program managers of ACAT ID programs. For ACAT IAM programs, the Assistant Secretary of Defense (Networks and Information Integration) (ASD(NII)), as the Department of Defense (DoD) Chief Information Officer, serves as the MDA.

DoD Acquisition Authority Chain

Program Executive Officers

The position of Program Executive Officer (PEO) was established in 1986 based on the Packard Commission Report. A PEO in the Army or Navy is typically a one- or two-star general officer or senior executive service civilian equivalent responsible for the first-line supervision of a group of like programs, each managed by a program manager. Examples are the Army's PEO for Tactical Missiles and the Navy's PEO for Tactical Aircraft Programs. The number of PEOs varies by Service and over time, but typically the Army and Navy have between 6 and 12 program executive officers at any one time. Several of the Army PEOs are dual-hatted. For example, the PEO, Ammunition is also the Commanding General, Picatinny Arsenal; other PEOs are dual-hatted as Deputy Commanding Generals (DCGs) of commodity commands (e.g., DCG of Aviation and Missile Command). In late 2003, the Air Force also decided to dual-hat Product Center Commanders as PEOs. Thus, the Commander, Air Armaments Center is also the PEO for Weapons Systems; the Commander, Electronic Systems Center is the PEO for Command and Control and Combat Support Systems; and the Commander, Aeronautical Systems Center is the PEO for Aircraft Systems. The F/A-22 Aircraft is considered to be a separate PEO. The Air Force also has a separate PEO for Combat and Mission Support.

Acquisition Program Reporting

The reporting structure for ACAT ID and ACAT IAM acquisition programs is illustrated in Figure 5-1.

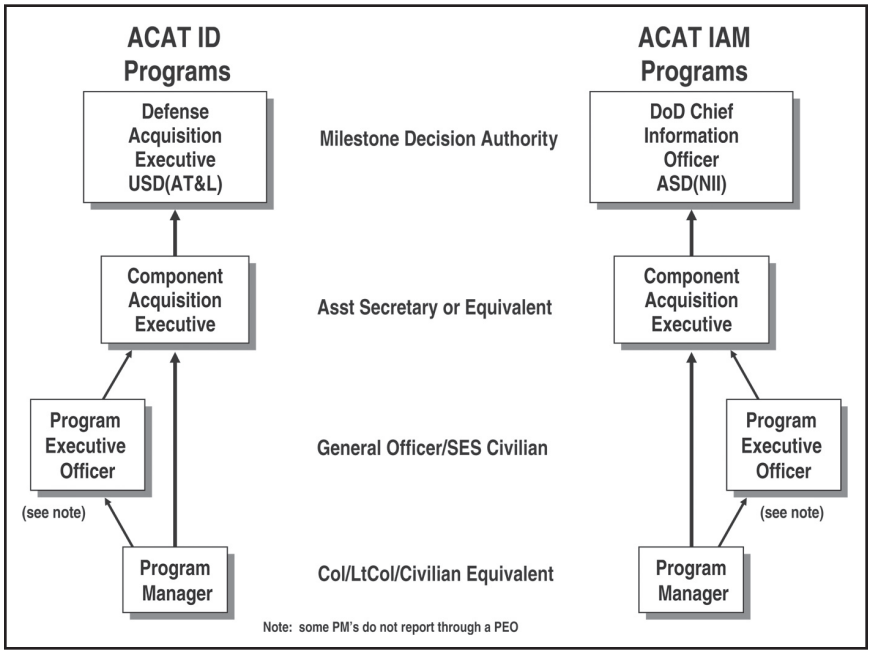

Figure 5-1. DoD Acquisition Authority Chain

Component Acquisition Executives

The senior official in each DoD Component responsible for acquisition matters is known as the Component Acquisition Executive (CAE). The CAE is the Secretary of the Military Department, or the Head of the Defense Agency, with power of redelegation. In the military departments, the Secretaries have delegated this responsibility to the assistant secretary level, commonly called the *Service Acquisition Executives*, or SAEs. The SAE for the Army is the Assistant Secretary of the Army for Acquisition, Logistics and Technology. The Department of the Navy SAE (includes Marine Corps) is the Assistant Secretary of the Navy for Research, Development, and Acquisition. The SAE for the Air Force is the Assistant Secretary of the Air Force for Acquisition. The SAE reports to the Secretary administratively and to the USD(AT&L) for acquisition management matters. Each SAE also serves as the Senior Procurement

Executive for their military department. In this capacity, they are responsible for management direction of their respective Service procurement system. The United States Special Operations Command also has an acquisition executive.

ACAT ID programs reviewed by the USD(AT&L) and programs reviewed by the components follow the same basic management oversight process, but the final decision authority is at a lower level for the latter programs. Similarly, ACAT IAM programs reviewed by the Assistant Secretary of Defense for Networks and Information Integration, and automated information system acquisition programs reviewed by the Components, follow the same basic management oversight process, but with the final decision authority at the lower level for the latter programs.

Component Chief Information Officers

The DoD Components each have chief information officers that provide advice and assistance to the Component Acquisition Executive for the oversight and review of automated information systems acquisition programs. The Department of the Army chief information officer is the G-6, reporting to the Secretary of the Army and the Army Chief of Staff. The Department of the Navy chief information officer reports to the Secretary of the Navy and has a deputy for Navy matters in the Office of the Chief of Naval Operations and a deputy for Marine Corps matters located in Headquarters, U.S. Marine Corps. In the Department of the Air Force, the chief information officer reports to the Secretary of the Air Force.

Direct Reporting Program Managers

Some program managers do not report to a Program Executive Officer, but instead report directly to the Component Acquisition Executive. These direct reporting program managers are typically colonels or one- or two-star officers or senior executive service civilian equivalents who manage priority programs of such a nature that direct access to the Component Acquisition Executive is deemed appropriate. Examples are the Department of the Army's Program Managers for the Joint Tactical Radio System and Unit of Action, and the Department of the Navy's Program Managers for Strategic Systems and the Expeditionary Fighting Vehicle.

Under Secretary of Defense (Acquisition, Technology and Logistics)

Title 10, United States Code, §133, authorizes the position of Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)). The USD(AT&L) is the principal staff assistant and advisor to the Secretary and Deputy Secretary of Defense for all matters relating to the DoD Acquisition System; research and development; advanced technology; developmental test and evaluation; production; logistics; installation management; military construction; procurement; environment security; and nuclear, chemical, and biological matters. The USD(AT&L) serves as the Defense Acquisition Executive, and for acquisition matters, takes precedence over the Secretaries of the military departments. The USD(AT&L) is responsible for establishing acquisition policies and procedures for the Department, and as Chair of the Defense Acquisition Board, makes milestone decisions on ACAT ID programs. The USD(AT&L) also establishes policy for the training and career development of the defense acquisition workforce.

In addition to a Principal Deputy USD(AT&L), who serves as chief advisor to USD(AT&L) and acts in the USD(AT&L)'s absence, the Office of the USD(AT&L) has the following four major subordinate staff elements.

- *Deputy Under Secretary of Defense for Acquisition and Technology*: Principal advisor to the USD(AT&L) for acquisition and contract management policy and supervises the following:

  — Deputy Under Secretary for Industrial Policy
  — Deputy Under Secretary for International Technology Security
  — Director, Defense Procurement and Acquisition Policy
  — Director, Defense Systems
  — Director, Small and Disadvantaged Business Utilization
  — Director, Defense Contract Management Agency

- *Director, Defense Research and Engineering*: Principal advisor to the USD(AT&L) for scientific and technical matters. Responsible for oversight of DoD science and technology programs, and supervises the following:

  — Deputy Under Secretary for Advanced Systems and Concepts
  — Deputy Under Secretary for Science and Technology
  — Deputy Under Secretary for Laboratory and Basic Sciences

— Director, Defense Advanced Research Projects Agency
— Director, Plans and Programs

- *Deputy Under Secretary of Defense for Logistics and Material Readiness:* Oversees policy for acquisition logistics, readiness, maintenance and transportation, and supervises the following:

  — Assistant Deputy Under Secretary for Supply Chain Integration
  — Assistant Deputy Under Secretary for Maintenance Policy
  — Assistant Deputy Under Secretary for Transportation Policy
  — Assistant Deputy Under Secretary for Logistics Systems Management
  — Assistant Deputy Under Secretary for Logistics Plans and Programs
  — Director, Defense Logistics Agency

- *Assistant to the Secretary of Defense, Nuclear, Biological and Chemical Defense Programs:* The ATSD(NCB) is the principal staff assistant and advisor to the Secretary and Deputy Secretary of Defense and the USD(AT&L) for all matters concerning the formulation of policy and plans for nuclear, chemical, and biological weapons. The ATSD(NCB) also is directly responsible to the Secretary and Deputy Secretary of Defense for matters associated with nuclear weapons safety and security, chemical weapons demilitarization, chemical and biological defense programs, and smoke and obscurants. The ATSD(NCB) supervises the following:

  — Deputy Assistant to the Secretary of Defense, Nuclear Matters
  — Deputy Assistant to the Secretary of Defense, Chemical/Biological Defense
  — Deputy Assistant to the Secretary of Defense, Nuclear Treaty Programs
  — Director, Defense Threat Reduction Agency

Other officials who report directly to the USD(AT&L) include:

— Deputy Under Secretary, Installations and Environment
— Director, International Cooperation
— Director, Acquisition Resources and Analysis
— Executive Director, Defense Science Board

— Director, Special Programs
— Director, Missile Defense Agency

Some of the above officials deal with program managers, Program Executive Officers, and Component Acquisition Executives on a regular basis, for example:

- *Director, Defense Procurement and Acquisition Policy:* Oversees contracting policy and procedures. Chairs the Defense Acquisition Regulatory Council, which issues the Defense Federal Acquisition Regulation Supplement, and represents the USD(AT&L) on the Federal Acquisition Regulatory Council. Appoints the Chair of the Defense Acquisition Policy Working Group that oversees the DoD 5000 series of acquisition regulations. Also responsible for the education and training of the acquisition, technology and logistics workforce.

- *Director, Acquisition Resources and Analysis:* Oversees the Defense Acquisition Executive Summary and Earned Value Management System processes, and provides the executive secretariat for the Defense Acquisition Board.

- *Director, Defense Systems:* Responsible for review of ACAT ID programs prior to the Defense Acquisition Board. Chairs the weapon systems overarching integrated product teams that advise the Defense Acquisition Board.

In addition to the above, there are several other offices that play a critical role in defense acquisition management. These include:

- *Assistant Secretary of Defense (Networks and Information Integration*): As the chief information officer for DoD, responsible for command, control, communications, computers, intelligence, surveillance and reconnaissance architecture, policies, and procedures, serves as the Department's MDA for ACAT IAM acquisition programs; and establishes acquisition policies for information technology systems.

- *Director, Operational Test and Evaluation*: Responsible for operational and live fire test and evaluation policy and procedures. Analyzes results of operational test and evaluation conducted on ACAT I programs and other selected programs deemed of a high enough priority to be selected for defense-level oversight. Reports on results of testing

ACAT I programs to the Secretary of Defense, the USD(AT&L), and the Senate and House Committees on Authorizations and Appropriations as to whether test results indicate the system is operationally effective and suitable. This office also renders a live fire test and evaluation report to the Secretary of Defense, the USD(AT&L), and the Senate and House Committees on Authorizations and Appropriations on whether covered systems (primarily ACAT I and ACAT II systems) meet survivability and lethality requirements.

For acquisition-related duties and responsibilities pertaining to the *Under Secretary of Defense (Policy), Under Secretary of Defense (Comptroller),* and *Director, Program Analysis and Evaluation,* see Chapter 8.

Defense Acquisition Boards and Councils

Several boards/councils are also key players in defense acquisition. These include:

Defense Acquisition Board (DAB). The DAB is the senior-level defense forum for advising the USD(AT&L) on critical issues concerning ACAT ID programs. Formal meetings may be held at each milestone to review accomplishments of the previous phase and assess readiness to proceed into the next phase. The DAB is *issue-oriented*. Typical issues addressed by this board include cost growth, schedule delays, and technical threshold breaches. The result of a DAB review is a decision from the USD(AT&L), documented in an Acquisition Decision Memorandum (ADM).

Defense Acquisition Board members include:

- Under Secretary of Defense (Acquisition, Technology and Logistics), Chairman
- Vice Chairman, Joints Chiefs of Staff, Co-Chairman
- Under Secretary of Defense (Comptroller)
- Under Secretary of Defense (Policy)
- Under Secretary of Defense (Personnel and Readiness)
- Assistant Secretary of Defense (Networks and Information Integration)
- Director, Operational Test and Evaluation
- Secretaries of the Army, the Navy, and the Air Force

Information Technology Acquisition Board (ITAB). The ITAB advises the ASD(NII)/DoD CIO on critical acquisition decisions for ACAT IAM programs. These reviews enable the execution of the DoD CIO's acquisition-related responsibilities for information technology systems, under the Clinger-Cohen Act and Title 10 of the United States Code. An acquisition decision memorandum (ADM) documents the decision(s) resulting from the review.

***Defense Space Acquisition Board (DSAB*).** The DoD Space MDA, the Under Secretary of the Air Force, convenes a DSAB at each decision point for space programs to obtain advice and information necessary to support a decision on whether or not to allow a program to proceed into the next acquisition phase. The DoD Space MDA chairs the DSAB, and the Vice Chairman of the Joint Chiefs of Staff is the Co-Chair. The DSAB Executive Secretary (Director, National Security Space Integration) facilitates the preparation for and execution of the DSAB meeting. DSAB principals are advisors and representatives of entities who have a material interest in the program under consideration. Their role is to act in an advisory capacity to the DSAB chairman.

Joint Requirements Oversight Council (JROC). The JROC leads the Joint Staff in developing policies and procedures for determining warfighting capabilities needs, and validates and approves warfighting capability needs for ACAT I and ACAT IA programs. The JROC is chaired by the Vice Chairman of the Joint Chiefs of Staff and includes the following members:

- Vice Chief of Staff, U.S. Army
- Vice Chief of Naval Operations
- Vice Chief of Staff, U.S. Air Force
- Assistant Commandant, U.S. Marine Corps

In addition to serving as chair of the JROC, the Vice Chairman also serves as Co-chair of the Defense Acquisition Board and is a member of the Senior Leadership Review Group (SLRG).

Cost Analysis Improvement Group (CAIG). This group provides the USD(AT&L) an Independent Cost Estimate of the life cycle cost for ACAT I acquisition programs. It is also responsible for improving cost estimating techniques and practices.

Integrated Product Teams

The Defense Integrated Product Team (IPT) concept was adapted from commercial business to streamline an antiquated, inefficient stove-piped process. These teams are composed of stakeholders representing all appropriate functional disciplines working together to build successful programs, thereby enabling decision makers to make the right decisions at the right time. Each IPT operates under the following broad principles:

- Open discussions with no secrets
- Qualified, empowered team members
- Consistent, success-oriented, proactive participation
- Continuous "up-the-line" communications
- Reasoned disagreement
- Issues raised and resolved early

For ACAT ID and ACAT IAM programs, there are generally two levels of IPTs above the program office—an *Overarching Integrated Product Team* (OIPT) at the Office of the Secretary of Defense, and *Working-Level IPTs* (WIPT) at the headquarters of the military department. The following paragraphs discuss the roles and responsibilities of these IPTs in the defense acquisition system.

Overarching Integrated Product Teams (OIPTs). Each ACAT ID program is assigned to an OIPT for management oversight. The primary role of this team is to provide strategic guidance and to help resolve issues early as a program proceeds through its acquisition life cycle. OIPTs for weapons systems are headed by the USD(AT&L)'s Director, Defense Systems. OIPTs for command, control, communications, and intelligence, and major automated information systems are headed by an official from the Office of the Assistant Secretary of Defense (Networks and Information Integration) (OASD(NII)).

OIPT members include the program manager, the program executive officer, component staff, USD(AT&L) staff, the Joint Staff, and other defense staff principals, or their representatives, involved in oversight and

review of a particular ACAT ID or ACAT IAM program. OIPTs meet as required and convene in formal session two weeks in advance of an anticipated milestone decision to assess information and to provide the status of the program to the MDA.

Working-Level Integrated Product Teams (WIPTs). The WIPTs are formed at the Pentagon-level military department headquarters. They meet as required to help the program manager with planning, preparation for OIPT reviews, and to help resolve issues. The leader of each WIPT is usually the program manager or the program manager's representative. While there is no one-size-fits-all approach, there are three basic tenets to which WIPTs must adhere:

1. The program manager is in charge of the program.
2. Integrated product teams are advisory bodies to the program manager.
3. Direct communication between the program office and all levels in the acquisition oversight and review process is expected as a means of exchanging information and building trust.

The program manager, or designee, may form and lead a type of WIPT called an Integrating IPT (IIPT) composed of a member from each of the other WIPTs. This team supports the development of strategies for acquisition and contracts, cost estimates, evaluation of alternatives, logistics management, cost-performance trade-offs, etc. The IIPT also coordinates the activities of the other WIPTs and ensures that issues not formally addressed by those teams are reviewed.

The following examples of working-level integrated product teams are offered as illustrations:

- *Test Strategy Integrated Product Team*: The purpose of this integrated product team is to assist in outlining the Test and Evaluation Master Plan (TEMP) for a major program. The objective of such an integrated product team is to reach agreement on the strategy and plan by identifying and resolving issues early, understanding the issues and the rationale for the approach, and, finally, documenting a quality TEMP that is acceptable to all organizational levels the first time.

- *Cost/Performance Integrated Product Team:* The best time to reduce life-cycle costs is early in the acquisition process. Cost reductions

must be accomplished through cost/performance tradeoff analyses, conducted before an acquisition approach is finalized. To facilitate that process, each ACAT I and ACAT IA program should establish a Cost/Performance IPT (CPIPT). The user community should have representation on this team.

Component Level Oversight

Each military service and defense agency has its own oversight and review process, which parallels the DAB and IT OIPT processes. These processes are used for managing non-major programs, and for reviewing ACAT ID or ACAT IAM programs prior to a program or milestone review at the defense level. The following is a summary of the individual military department Pentagon headquarters-level reviews and their respective chair. ACAT III and IV programs are reviewed in a similar fashion by the Program Executive Officers or the commander of an acquisition command.

Service Level Review	Chaired By
• Army Systems Acquisition Review Council	• Assistant Secretary of the Army (Acquisition, Logistics and Technology)
• Program Decision Meeting (Navy)	• Assistant Secretary of the Navy (Research, Development and Acquisition)
• Program Decision Meeting (Marine Corps)	• Assistant Secretary of the Navy (Research, Development and Acquisition)
• Air Force Review Board	• Assistant Secretary of the Air Force (Acquisition)

6

DETERMINING JOINT WARFIGHTING NEEDS

This chapter focuses on a capabilities-based approach to identifying current and future gaps in the ability to carry out joint warfighting missions and functions. This process is called the Joint Capabilities Integration and Development System, or JCIDS. In 2003, JCIDS replaced the requirements generation system used by the Department of Defense (DoD) for many decades. JCIDS involves an analysis of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) in an integrated, collaborative process to define gaps in warfighting capabilities and propose solutions. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01E, *Joint Capabilities Integration and Development System (JCIDS)* provides the policy and top-level description of JCIDS. The details for action officers who will be performing the day-to-day work of identifying, describing, and justifying warfighting capabilities is provided by CJCS Manual 3170.01B, *Operation of the Joint Capabilities Integration and Development System.*

Capabilities represent top-level warfighting needs (e.g., enhance individual soldier survivability; improve night-fighting ability) that are studied as part of the JCIDS Capabilities Based Assessment (CBA) process. Out of this process emerges a set of alternative materiel and/or non-materiel approaches to provide the required capability. This is further refined into one or more DOTMLPF Change Recommendations (DCRs) for non-materiel and/or minor materiel approaches linked to DOTMLPF, and/or an Initial Capabilities Document (ICD) that proposes a prioritized list of non-materiel and materiel approaches to provide the desired joint warfighting capability. The previous term "requirement" was used to define both a top-level need for additional warfighter capability and system-specific performance. It is often used interchangeably with the newer term "capability."

Four JCIDS documents are used in DoD to support the acquisition process. The Joint Capabilities Document (JCD) is used by combatant commands to define sets of capabilities necessary to support missions assigned by the Unified Command Plan, or by Combat Support Agencies with designated functional manager roles for their functional area of responsibility, in support of the Family of Future Joint Concepts or concepts of operation.

The Initial Capabilities Document, or ICD, provides the definition of the capability need and where it fits in the broader concepts and architectures. The ICD is used to support the Concept Decision and Milestone A decisions and to guide the *Concept Refinement* and the *Technology Development* phases of the acquisition process.

During the *Technology Development* phase, a Capability Development Document, or CDD is written. The CDD supports a Milestone B decision by providing more detail on the materiel solution to provide the capability previously described in the ICD. The CDD also provides the thresholds and objectives for the system attributes against which the delivered capability will be measured. Once approved, the CDD is used to guide the *System Development and Demonstration* phase of the acquisition process.

During the *System Development and Demonstration* (SDD) phase, the Capability Production Document, or CPD is developed. The CPD is used to support the Milestone C decision before a program enters Low Rate Initial Production and initial operational test and evaluation. The CPD may contain refined performance thresholds from the CDD based on lessons learned during the System Development and Demonstration phase.

Key Performance Parameters

Key Performance Parameters (KPP) are those attributes or performance characteristics considered most esstential for an effective military capability. The CDD and the CPD both contain KPPs that are included in the Acquisition Program Baseline (APB) (see Chapter 7 for information on the APB). Either the Joint Requirements Oversight Council (JROC) or the DoD Component validate the KPPs, depending on the Joint Potential Designator (JPD) of the program, which is discussed later.

Several KPPs are required in all CDDs and CPDs. These include the Net-Ready KPP (NR-KPP) and Force Protection and Survivability KPPs. A

NR-KPP is required for all Information Technology and National Security Systems (NSS) user to enter, process, store, display, or transmit DoD information, regardless of classification or sensitivity. Exceptions are those systems that do not communicate externally, for example, some Automated Information Systems (AIS). See the discussion of Interoperability later in this chapter.

Force Protection and Survivability KPPs are applicable to manned systems and systems designed to enhance personnel survivability when employed in an asymmetric threat environment. Force protection attributes are those that contribute to protection of personnel. Survivability attributes are those that contribute to the survivability of manned systems.

The JCIDS Process and Acquisition Decisions

The link of the JCIDS process to acquisition milestones is shown in Figure 6-1. More information on milestones and phases is provided in Chapter 7.

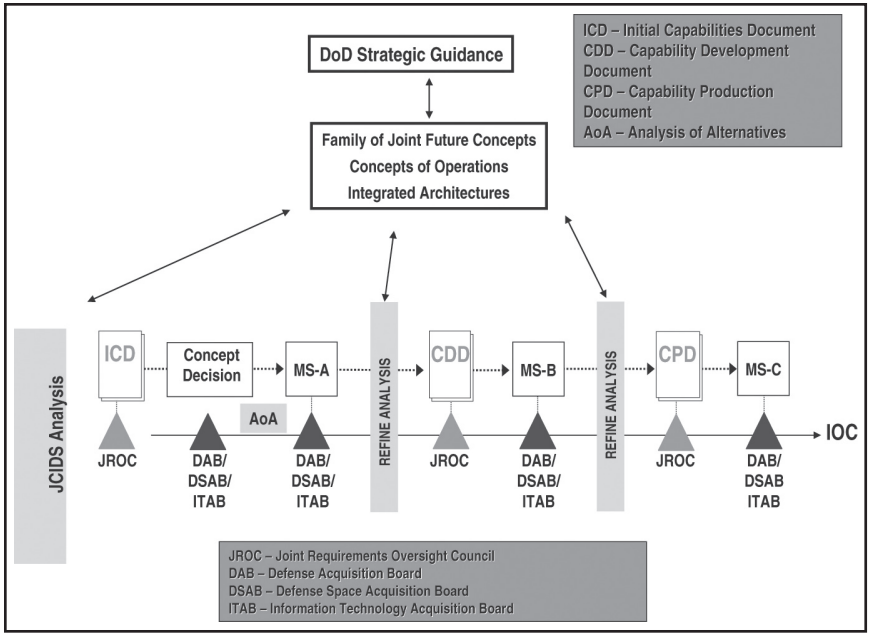

Figure 6-1. JCIDS Link to Defense Acquisition

Identifying Needed Capabilities

The capabilities identification and assessment methodology is the backbone of the JCIDS process (see Figure 6-2). It is a top-down approach starting with strategic policy and guidance from the President and the Chairman, Joint Chiefs of Staff. The President's **National Security Strategy,** issued annually by the White House, provides the Chairman top-level policy upon which to base the National Military Strategy (NMS). A ***National Defense Strategy (NDS*)** is also issued by the Secretary of Defense in response to the NSS and provides additional guidance for the Chairman, Joint Chiefs of Staff in developing the NMS. The **National Military Strategy,** issued as needed by the Joint Staff, articulates the Chairman's recommendations to the President and Secretary of Defense on the employment of the military element of power in support of the President's National Security Strategy.

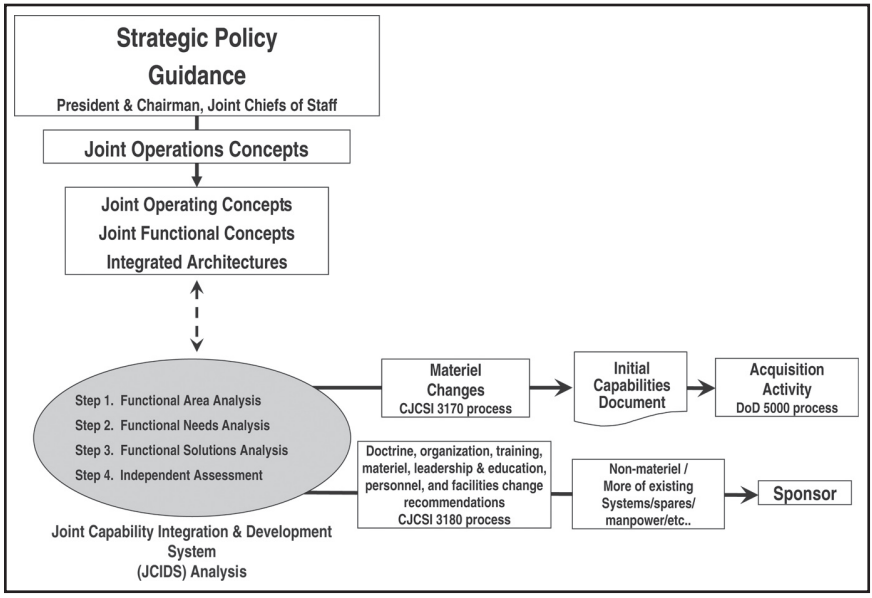

Figure 6-2. Joint Capabilities Integration & Development System

Based on this top-level strategic policy and guidance, the Joint Staff prepares JCIDS supporting documents to refine the guidance into more detailed concepts and architectures that sponsors can use as a basis for the JCIDS analysis. **Joint Operations Concepts** describe how the joint force intends to operate 15 to 20 years from now. The **Joint Operating Concept** describes how the future joint force commander will plan, prepare, deploy,

employ, and sustain a joint force against potential adversaries' capabilities or crisis situations, and guide the development and integration of joint functional concepts to provide joint capabilities. The **Joint Functional Concept** describes how a future joint force commander will integrate a set of related military tasks to attain capabilities required across the range of military operations. **Integrated Architectures** consist of multiple views or perspectives (operational, systems, technical) that facilitate integration and promote interoperability across family-of-systems and systems-of-systems and compatibility among related architectures.

The Sponsor

In the JCIDS, the sponsor "is the DoD Component responsible for all common documentation, periodic reporting, and funding actions required to support the capabilities development and acquisition process for a specific capability proposal." The Training and Doctrine Command in the Army, the Center for Naval Analysis and/or the Office of the Chief of Naval Operations staff in the Navy, the Combat Developments Command in the Marine Corps, and the operational commands (e.g., Air Combat Command or Air Mobility Command), supported by the Office of Aerospace Studies in the Air Force, are typical sponsors of JCIDS analysis.

JCIDS Analysis. The JCIDS supporting documents provide sponsors a common joint warfighting construct upon which to base their JCIDS analysis to determine capabilities needed for the joint force and information for the development of the ICD. JCIDS analysis (Figure 6-2) is a four-step process, each step led by the sponsor:

1. *Functional Area Analysis (FAA).* The first step in the JCIDS process is the FAA. The FAA identifies the operational tasks, conditions, and standards needed to accomplish military objectives. The results of the FAA are the required warfighting tasks to be reviewed in a follow-on functional needs analysis.

2. *Functional Needs Analysis (FNA).* The second step is to assess the ability of current and programmed joint capabilities to accomplish the required warfighting tasks identified in the FAA. The result of the FNA is a list of capability gaps that requires solutions.

3. *Functional Solutions Analysis (FSA).* The third step in JCIDS analysis is an operationally based assessment of all DOTMLPF and policy

approaches to solving the one or more of the capability gaps identified in the FNA. The result is a set of potential materiel and non-materiel approaches to fixing the capability gaps. If analysis determines that a non-materiel approach not associated with a new defense acquisition program that affects joint resources is required, the sponsor develops a Joint DOTMLPF Change Recommendation (DCR) for review and approval of the Chairman, JROC. On the other hand, if the sponsor determines a new defense acquisition program may be required, further analysis will be done to identify alternative ideas for materiel approaches. Next, an analysis of these alternatives will be performed to provide a prioritized list or combinations of approaches considering technological maturity, risk, supportability, and affordability.

4. *Post Independent Analysis*. The final step in JCIDS analysis is the post independent analysis. Here, the sponsor will consider all the analysis results to determine which integrated DOTMLPF approach(es) best address the gap(s) in required joint warfighting capability. This information will be compiled into an appropriate recommendation—either a Joint DCR or an ICD.

Joint Potential Designators

Within JCIDS there are three designations a proposal can receive based on its Acquisition Category (ACAT) and its potential for impacting the joint warfighter. The joint designation determines who validates and/or approves a proposal. Joint Potential Designators, or JPDs, are: JROC Interest, Joint Integration, and Independent.

JROC Interest applies to all ACAT I and IA programs and ACAT II and below programs where the capabilities have a significant impact on joint warfighting, a potential impact across Services, or on interoperability in allied or coalition operations. This designation may also apply to intelligence capabilities that support DoD and national intelligence requirements.

Joint Integration applies to ACAT II and below programs where the capabilities and/or systems associated with the document do not significantly affect the joint force, and an expanded review is not required, but interoperability and supportability, intelligence, and/or insensitive munitions certification is required.

Independent applies to ACAT II and below programs where the capabilities and/or systems associated with the document do not significantly affect the joint force, an expanded review is not required, and no certifications are required.

Functional Capability Boards

The JROC charters Functional Capability Boards (FCBs) responsible for the organization, analysis, and prioritization of joint warfighting capabilities within an assigned functional area. As of the date of this guidebook, the JROC had chartered FCBs for Force Application, Protection, Command and Control, Battlespace Awareness, Net-Centric Operations, Force Management, Joint Training, and Focused Logistics. In addition to the review and validation of JCIDS documents shown in Figure 6-3, FCBs are responsible for all aspects, materiel and nonmaterial, of their assigned functional area.

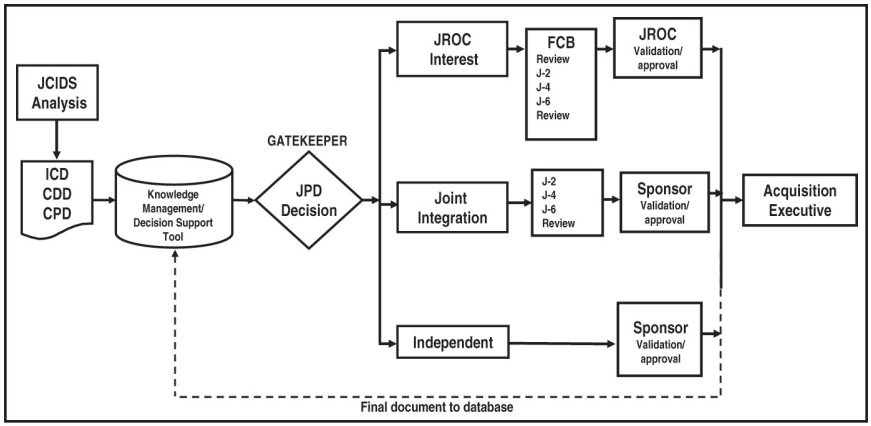

Figure 6-3. Joint Capabilities Integration & Development System Document Flow

Interoperability

Interoperability is the ability of systems, units, or forces to provide data, information, materiel, and services to, and accept services from, other systems, units, or forces, and to use the services so exchanged to enable them to operate effectively together. All defense systems must be interoperable with other U.S. and allied defense systems, as defined in the JCIDS and interoperability documents. The program manager describes the treatment of interoperability requirements in the acquisition strategy. In an evolutionary acquisition involving successive increments of increasing

capability, this description should address each increment, as well as the transitions from increment to increment. Chapter 7 will explain the evolutionary acquisition process in more detail.

Consistent with the Department's philosophy of treating new systems as components of a family-of-systems, if enhancements to the program manager's program or to other programs are required to support interoperability requirements, the program manager must identify the technical, schedule, and funding issues for both the acquisition program and the other program(s). Some examples of interoperability include:

- Aircraft from different Services and allied countries can communicate with each other and with ground forces.

- Aircraft from one Service can exchange target information with a ship of another Service and/or an allied country.

- Ammunition from one Service can be used by weapons from another Service, and/or an allied country.

Previously, to foster interoperability, Defense policy emphasized identifying and meeting Information Exchange Requirements (IERs) between systems, whether in voice, video, or text format. An Interoperability KPP was required for all systems based on their IERs. For systems with requirements to interchange information with a large number of other systems, the identification and testing of IERs became a huge burden.

A new approach was needed that would reduce complexity, be compatible with the emerging Global Information Grid (GIG),[8] and also complement the trend toward Net-Centric Warfare (NCW), defined as the networking of sensors, decision makers, and "shooters" to achieve increased combat power, higher operational tempo, greater lethality, and increased survivability and synchronization.[9] This new approach replaced the interoperability KPP policy based on delineating specific IERs for every system-to-system

[8] The Global Information Grid is the globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand to warfighters, policy makers, and support personnel. (CJCSI 6212.01C)

[9] See *Network Centric Warfare* by David L. Alberts, Department of Defense C4ISR Cooperative Research Program, 1999.

requirement with a NR-KPP that required systems to be "net-ready," that is, be able to interchange information via a common network. Essentially, the "one-one" paradigm of the previous Interoperability KPP was replaced by the "many-to-one" paradigm of the NR-KPP.

J-6 Interoperability and Supportability Certification, Testing, and Validation Process

All programs having joint interoperability requirements, that is an NR-KPP, regardless of ACAT, are subject to the J-6 Interoperability and Supportability Certification, Testing, and Validation Process. J-6 will certify all interoperability and supportability capabilities, which must be tested and certified as having met requirements by the Defense Information Systems Agency's (DISA)'s Joint Interoperability Test Command (JITC). This testing should be performed during developmental and operational testing whenever possible to conserve resources. Upon successful completion of testing, DISA(JITC) will issue a Joint Interoperability Test Certification signifying that the system has met its interoperability requirements. At the end of the entire process, J-6 validates the interoperability and supportability capabilities certification, the JITC Joint System Interoperability Test Certification, and the NR-KPP.

7

ACQUISITION MANAGEMENT FRAMEWORK

Acquisition Life Cycle

The management framework for defense systems acquisition is commonly referred to as the acquisition life cycle. The generic model for this process is illustrated in Figure 7-1. Program managers tailor/streamline this model to the maximum extent possible, consistent with technical risk, to provide new systems to the warfighter as fast as possible. The process provides for multiple entry points consistent with a program's technical maturity, validated requirements, and funding. Entrance criteria for each phase of the life cycle guide the Milestone Decision Authority (MDA) in determining the appropriate point for a program to enter the acquisition process.

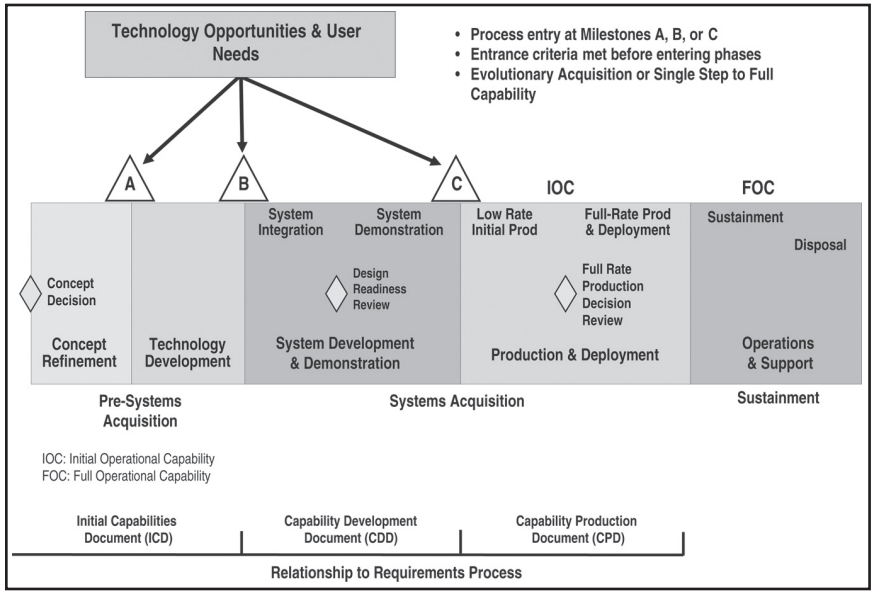

Figure 7-1. Defense Acquisition Management Framework

The life cycle process consists of periods of time called phases separated by decision points called milestones. Some phases are divided into two efforts separated by program reviews. These milestones and other decision points provide both the program manager and MDAs the framework with which to review acquisition programs, monitor and administer progress, identify problems, and make corrections. The MDA will approve entrance into the appropriate phase or effort of the acquisition process by signing an acquisition decision memorandum upon completion of a successful decision review.

The life cycle of a program begins with planning to satisfy a mission need before the program officially begins (see Chapter 6). Program initiation normally occurs at Milestone B. The life cycle process takes the program through research, development, production, deployment, support, upgrade, and finally, demilitarization and disposal. *Initial Operational Capability*, or IOC, is that point at which a selected number of operational forces have received the new system and are capable of conducting and supporting warfighting operations. References to "life cycle costs" in defense acquisition include all costs associated with the system, from "cradle to grave."

Technological Opportunities and User Needs. The Defense Science and Technology Program identifies and explores technological opportunities within Department of Defense (DoD) laboratories and research centers, academia, and commercial sources. The aim is to provide the user with innovative war-winning capabilities and reduce the risk associated with promising technologies before they are introduced into the acquisition system. Three mechanisms are available to facilitate the transition of innovative concepts and superior technology to the acquisition process: *1) Advanced Technology Demonstrations, 2) Advanced Concept Technology Demonstrations,* and *3) Joint Warfighting Experiments.*

Advanced Technology Demonstrators are used to demonstrate technical maturity and the potential for enhanced military capability or cost effectiveness. They are subject to oversight and review at the Service or component level. An Advanced Technology Demonstrator can become the basis for a new acquisition program, or for the insertion of new technology into an existing program.

Advanced Concept Technology Demonstrators are used to demonstrate the military utility of a proven technology and to develop the concept of

operations for the system to be demonstrated. Consequently, these demonstrators are typically funded and engineered to endure up to two years of service in the field before entering the acquisition process. Oversight and review of Advanced Concept Technology Demonstrators is at the Office of the Secretary of Defense and the Joint Staff level.

Experiments, such as the warfighting experiments conduced by the military services and the Joint Forces Command, are used to develop and assess concept-based hypotheses to identify and recommend the best value-added solutions for changes to doctrine, organizational structure, training and education, materiel, leadership, and people required to achieve significant advances in future joint operational capabilities. They are also subject to oversight and review at the military department headquarters, and the Office of the Secretary of Defense and Joint Staff.

The following discussion provides a brief review of each of the phases, milestones, and other decision reviews. No "one size fits all." Each program structure must be based on that program's unique set of requirements and available technology. The process of adjusting the life cycle to fit a particular set of programmatic circumstances is often referred to as "tailoring." The number of phases, key activities, and decision points are tailored by the program manager based on an objective assessment of the program's technical maturity and risks, and the urgency of the mission need.

Milestone decisions are made by the appropriate MDA depending on the Acquisition Category (ACAT) of the program (see Chapter 5). The nature and extent of milestone reviews depends on the ACAT of the program and the MDA. Prior to each decision point, the appropriate Joint Capabilities Integration and Development System (JCIDS) document must be approved (see Chapter 6).

Pre-Systems Acquisition

Pre-systems acquisition is composed of activities in development of user needs, in science and technology, and in technology development work specific to the refinement of materiel solution(s) identified in the approved Initial Capabilities Document (ICD). There are two *phases* in pre-systems acquisition, Concept Refinement and Technology Development.

Concept Refinement begins with a Concept Decision by the MDA. During this phase a Technology Development Strategy (TDS) is developed to help

guide the efforts during the next phase, Technology Development. Also, a study called an *Analysis of Alternatives* (AoA) is conducted to refine the selected concept documented in the approved ICD. To achieve the best possible system solution, Concept Refinement places emphasis on innovation and competition, and on existing commercial off-the-shelf and other solutions drawn from a diversified range of large and small businesses. Concept Refinement ends when the MDA approves the preferred solution supported by the AoA, and approves the associated TDS.

Technology Development begins after a **Milestone A** decision by the MDA approving the TDS. The ICD and TDS guide the work during Technology Development. A favorable Milestone A decision normally does not mean a new acquisition program has been initiated—except that shipbuilding programs may be initiated at the beginning of Technology Development. The purpose of this phase is to reduce technology risk and to determine the appropriate set of technologies to be integrated into a full system. During Technology Development, a series of technology demonstrations may be conducted to help the user and the developer agree on an affordable, militarily useful solution based on mature technology. The project is ready to leave this phase when the technology for an affordable increment of militarily useful capability has been demonstrated in a relevant environment.

Systems Acquisition

Milestone B. Milestone B will normally be *program initiation* for defense acquisition programs. For shipbuilding programs, the lead ship in a class of ships is also approved at Milestone B. Each increment of an evolutionary acquisition (explained later) will have its own Milestone B. Before making a decision, the MDA will confirm that technology is mature enough for systems-level development to begin, the appropriate document from the Joint Capabilities Integration and Development System (JCIDS) (see Chapter 6) has been approved, and funds are in the budget and the out-year program for all current and future efforts necessary to carry out the acquisition strategy. At Milestone B, the MDA approves the acquisition strategy, the acquisition program baseline, and authorizes entry into the System Development and Demonstration Phase.

System Development and Demonstration (SDD) Phase. Entrance criteria for this phase are technology (including software) maturity, funding, and an approved JCIDS document—the Capability Development

Document. Programs that enter the acquisition process for the first time at Milestone B, must have an Initial Capabilities Document (ICD) (except for programs arising from Advanced Concept Technology Demonstrations) and a Capability Development Document. Unless there is some overriding factor, the maturity of the technology will determine the path to be followed by the program. Programs entering at Milestone B must have both a system architecture (defined set of subsystems making up the system), and an operational architecture (description of how this system interacts with other systems, to include passing of data). The efforts of this phase are guided by the Key Performance Parameters (KPPs) found in the approved Capability Development Document and in the Acquisition Program Baseline (APB). The APB establishes program goals, called thresholds and objectives, for cost, schedule, and performance parameters that describe the program over its life cycle. This phase typically contains two efforts, *System Integration* and *System Demonstration*. A *Design Readiness Review* takes place at the end of System Integration.

- *System Integration.* A program enters System Integration when the program manager has a technical solution for the system, but the component subsystems have not yet been integrated into a complete system. This effort typically includes the demonstration of prototype articles or Engineering Development Models (EDM), sometimes in a competitive "fly-off". A program leaves System Integration after prototypes have been demonstrated in a relevant environment (e.g., a first flight, or interoperable data flow across system boundaries), the system configuration has been documented, and a successful Design Readiness Review has been completed.

- *Design Readiness Review.* The Design Readiness Review during SDD provides an opportunity for a mid-phase assessment of design maturity as evidenced by measures such as the number of design reviews successfully completed; the percentage of drawings completed; planned corrective actions to hardware/software deficiencies; adequate developmental testing; and an assessment of environment, safety, and occupational health risks; etc. Successful completion of the Design Readiness Review ends System Integration and continues the SDD phase into the System Demonstration effort.

- *System Demonstration.* This effort is intended to demonstrate the ability of the system to operate in a useful way consistent with the approved KPPs. The program enters System Demonstration when the program

manager has demonstrated the system in prototypes or EDMs. This effort ends when the system is demonstrated using EDMs in its intended environment; has been satisfactorily measured against the KPPs; industrial capabilities are reasonably available; and the system meets or exceeds exit criteria and Milestone C entrance requirements. Developmental test and evaluation is conducted to assess technical progress against critical technical parameters, and operational assessments are conducted to demonstrate readiness for production. The completion of this phase is dependent on a decision by the MDA to commit the program to production at Milestone C, or a decision to end the effort.

Milestone C. The MDA makes the decision to commit the DoD to production at Milestone C. Milestone C authorizes entry into Low Rate Initial Production (LRIP), or into production or procurement for systems that do not require LRIP. For entry into limited deployment in support of operational testing for Major Automated Information Systems or software-intensive systems with no production components, Milestone C authorizes limited deployment in support of operational testing. If Milestone C is LRIP approval, a subsequent review and decision authorizes full-rate production.

Production and Deployment Phase. The purpose of this phase is to achieve an operational capability that satisfies mission needs. Operational test and evaluation determines the effectiveness and suitability of the system. Entrance into this phase depends on acceptable performance in development, test and evaluation, and operational assessment; mature software capability; no significant manufacturing risks; manufacturing processes under control (if Milestone C is full-rate production); an approved ICD (if Milestone C is program initiation—does not apply to programs arising from Advanced Concept Technology Demonstrations); an approved Capability Production Document (CPD); acceptable interoperability; acceptable operational supportability; and demonstration that the system is affordable throughout the life cycle, optimally funded, and properly phased for rapid acquisition. For most defense acquisition programs, Production and Deployment has two major efforts, LRIP and Full-Rate Production and Deployment, and includes a Full-Rate Production Decision Review.

- *Low Rate Initial Production.* This effort is intended to result in completion of manufacturing development in order to ensure adequate and

efficient manufacturing capability and to produce the minimum quantity necessary to provide production or production-representative articles for Initial Operational Test and Evaluation (IOT&E), establish an initial production base for the system; and permit an orderly increase in the production rate sufficient to lead to full-rate production upon successful completion of operational (and live-fire, where applicable) testing. The MDA determines the LRIP quantity for ACAT I and II programs at Milestone B. LRIP is not applicable to automated information systems or software-intensive systems with no developmental hardware; however, a limited deployment phase may be applicable. LRIP for ships and satellites is production of items at the minimum quantity and rate that is feasible and that preserves the mobilization production base for that system.

- *Full-Rate Production Decision Review.* Before granting a favorable Full-Rate Production Decision Review, the MDA considers IOT&E and live fire test and evaluation results (if applicable); demonstrated interoperability; supportability; cost and manpower estimates; and command, control, communications, computer and intelligence supportability and certification (if applicable). A favorable Full-Rate Production Decision authorizes the program to proceed into the Full-Rate Production and Deployment portion of the Production and Deployment Phase.

- *Full-Rate Production and Deployment.* The system is produced and delivered to the field for operational use. During this phase, the program manager must insure that systems are produced at an economical rate and deployed in accordance with the user's requirement to meet the initial operational capability requirement specified in the Capability Production Document. Follow-on Operational Test and Evaluation may also be conducted, if appropriate, to confirm operational effectiveness and suitability, or verify the correction of deficiencies. Operations and support begins as soon as the first systems are fielded/deployed; therefore, the Production and Deployment Phase overlaps the next phase, Operations and Support.

O*perations and Support Phase*. During this phase Full Operational Capability is achieved, each element of logistics support is evaluated (e.g., supply, maintenance, training, technical data, support equipment), and operational readiness is assessed. Logistics and readiness concerns dominate this phase. The supportability concept may rely on a government

activity, a commercial vendor, or a combination of both to provide support over the life of the system. System status is monitored to ensure the system continues to meet the user's needs. The Operations and Support Phase includes sustainment and disposal.

- *Sustainment.* Sustainment includes supply, maintenance, transportation, sustaining engineering, data management, configuration management, manpower, personnel, training, habitability, survivability, environment, safety (including explosives safety), occupational health, protection of critical program information, anti-tamper provisions, and Information Technology (IT), including National Security Systems (NSS) supportability, and interoperability functions. Effective sustainment of weapon systems begins with the design and development of reliable and maintainable systems through the continuous application of a robust systems engineering methodology. The program manager works with the users to document performance and support requirements in performance agreements specifying objective outcomes, measures, resource commitments, and stakeholder responsibilities. System modifications are made, as necessary, to improve performance and reduce ownership costs. Product improvement programs or service life extension programs may be initiated as a result of experience with the systems in the field. During deployment and throughout operational support, the potential for modifications to the fielded system continues. Modifications that are of sufficient cost and complexity to qualify as ACAT I or ACAT IA programs are considered as separate acquisition efforts for management purposes. Modifications that do not cross the ACAT I or ACAT IA threshold are considered part of the program being modified.

- *Disposal* of the system occurs at the end of its useful life. The program manager should have planned for disposal early in the system's life cycle and ensured that system disposal minimizes DoD's liability due to environmental, safety, security, and health issues. Environmental considerations are particularly critical during disposal as there may be international treaty or other legal considerations, requiring intensive management of the system's demilitarization and disposal.

Evolutionary Acquisition

Evolutionary acquisition is the preferred DoD acquisition strategy for rapid acquisition of mature technology. The acquisition strategy defines

what approach will be followed to develop, test, produce, and field the system. An evolutionary approach delivers capability in increments, recognizing, up front, the need for future capability improvements. The objective is to balance needs and available capability with resources, and to put capability into the hands of the warfighter quickly. The approaches to achieve evolutionary acquisition require collaboration between the user, tester, and developer. They include:

- *Spiral Development.* In this process, a desired capability is identified, but the total end-state requirements are not known at program initiation. Those requirements are refined through demonstration and risk management; there is continuous user feedback; and each increment provides the user the best possible capability. The requirements for future increments depend on feedback from users and technology maturation.

- *Incremental Development.* In this process, a desired capability is identified, the end-state requirement is known, and that requirement is met over time by developing several increments, each dependent on available mature technology.

Key Activities

All acquisition programs, regardless of ACAT, must accomplish certain key activities. These activities generate information that structures and defines the program and facilitates planning and control by the program manager and oversight by a MDA. The information generated by key activities may be contained in stand-alone documents structured in accordance with the desires of the MDA. Most of this information/documentation is carefully constructed by the program manager using integrated product teams.

Key activities include development/update and approval of JCIDS documents, cost estimating, formulation of an acquisition strategy and program structure, contract planning and management, budget execution, formulation of an acquisition program baseline, test planning, interoperability planning, and other key activities as noted below:

Validation and Approval of JCIDS Documents. The program must address the mission capability need documented in the Initial Capabilities Document, and meet the system-level performance parameters documented

in the Capability Development Document and Capability Production Document (see Chapter 6).

Selection of a Preferred Solution. Alternatives that could potentially meet the mission need are analyzed as part of the JCIDS analysis process. For an ACAT I program this process can be quite formal, requiring significant time, effort, and dollars. The JCIDS analysis supporting a preferred solution is documented in the Initial Capabilities Document and then further refined by a study called an *Analysis of Alternatives (AoA)*.

Cost Estimating. Life cycle cost estimating must be accomplished to support inputs into the Program Objectives Memorandum (see Chapter 8), and the budget. Cost estimating is done at the program level (called the *Program Office Estimate*), the Component headquarters level (called a *Component Cost Analysis*), and at the **Defense** staff level (called an *Independent Cost Estimate*), depending on the ACAT of the program. (See Chapter 4.) Additionally, cost estimating supports *affordability assessments,* which determine whether a Component can "fit" a program within its projected budget authority (over time) given all of the Component's other commitments.

Preparation of an Acquisition Strategy and Program Structure. The acquisition strategy, developed by the program manager and approved by the MDA, is a comprehensive, overarching master plan that details how the program's goals and objectives will be met. It serves as a "roadmap" for program execution from program initiation through post-production support. It describes the key elements of the program (e.g., requirements, resources, testing, contracting approach, and open systems design) and their interrelationship, and evolves over time, becoming increasingly definitive as the program matures. Acquisition strategies are tailored to the specific needs of an individual program. Program structure charts are schedules that graphically depict the time phasing of key events in the acquisition strategy, like milestones, testing, and others.

Contract Planning and Management. Contracting for goods and services is fundamental since the functions inherent in systems acquisition, such as analysis, design, development, test, production, sustainment, modification, and disposal of systems are accomplished through contracts with private industry. Typical activities include preparing an *Acquisition Plan* (a description of contracting strategy for the program with emphasis on the types and numbers of contracts to be awarded in an upcoming

phase), preparing the *Request for Proposal* (a document that describes the task(s) or service(s) that the government wants industry to propose against), conducting a source selection (a process to select the winning contractor(s)), and performing contractor surveillance and monitoring contract performance.

Budget Execution. Resources must be budgeted and obtained to execute contracts with industry. This includes formulating input for the *Program Objectives Memorandum* (a spending plan covering a 6-year period), the budget, and other programmatic or financial documentation in support of the Planning, Programming, Budgeting and Execution (PPBE) process (see Chapter 8). Funds are "obligated" upon the signing of a contact; funds are "outlayed" as the government makes actual payment in accordance with the contract for goods and services rendered.

Preparation of an Acquisition Program Baseline (APB). The baseline contains the most important cost, schedule, and performance parameters described in terms of threshold and objective values. A threshold value is a required value, while an objective value is a desired value. Schedule parameters include key schedule events, such as milestone reviews, initiation of key testing activities, and the start of production. APB performance parameters are the Key Performance Parameters specified in the Capability Development Document and Capability Production Document (see Chapter 6). Thus, the APB is a convenient summary of the most important aspects of a program (cost, schedule, and performance), and it provides a useful tool for management to assess how well a program is progressing towards its stated objectives. The APB is developed by the program manager and approved by the chain of authority up to the MDA. For example, the APB for an ACAT ID program will be approved by its Program Executive Officer, the Component Acquisition Executive, and Defense Acquisition Executive.

Test Planning. Test planning is central to the formulation of a coherent acquisition strategy. There is a variety of testing that must be planned and accomplished, either to confirm program progress or to conform to statutory dictate. After all, it is by testing that DoD validates the performance requirements identified in the Capability Production Document by the user and promised in the acquisition program baseline by the program manager. Testing includes developmental test and evaluation, operational test and evaluation, and live fire test and evaluation, as appropriate. The program manager's *Test and Evaluation Master Plan (TEMP)* documents

the overall structure and objectives of the test and evaluation program. It provides a framework to generate detailed test and evaluation plans for a particular test, and it contains resource and schedule implications for the test and evaluation program.

Interoperability Planning. Interoperability within and across the military services and partners in coalition warfare is essential for successful combat operations. To facilitate planning and ensure interoperability policy is being considered and addressed, an *Information Support Plan (ISP)* is required for all weapon systems/programs that interface with command, control, communications, computers, and intelligence systems. The ISP includes system description, employment concept, operational support requirements, and interoperability and connectivity requirements.

Formulation of Exit Criteria. Milestone decision authorities use *exit criteria* to establish goals for an acquisition program during a particular phase. At each milestone review, the program manager proposes exit criteria appropriate to the next phase of the program for approval by the MDA. Exit criteria are phase-specific tasks selected to track progress in important technical, schedule, or risk management areas. They act as "gates," which when successfully passed, demonstrate that the program is on track to achieve its final goals. Examples of appropriate exit criteria are achieving a level of performance (e.g., engine thrust, or missile range) or successful accomplishment of a task (e.g., first flight). Exit criteria are documented in the Acquisition Decision Memorandum issued by the MDA upon completion of a milestone review.

Technical Management. This is a broad term including the management of a totally integrated effort of system engineering, test and evaluation, production, and logistics support over the system life cycle. Its goal is timely deployment of an effective system, sustaining it, and satisfying the need at an affordable cost. Technical management involves balancing a system's *cost*, *schedule*, and *performance*.

- *Cost* includes all funds required to design, develop, produce, operate, support, and dispose of a system.

- *Schedule* includes the time it takes to design, develop, produce, and deploy a fully supported system.

- *Performance* is the degree to which a system can be expected to perform its mission in combat.

Technical management includes defining the system; conducting design engineering; performing systems engineering (system cost, schedule, and performance trade-offs); developing/acquiring computer resources (including software); planning for logistics support; identifying and tracking reliability, availability, and maintainability requirements; transitioning from development to production; configuration management; ensuring producibility of the final design; defining manufacturing processes and controls; and planning for disposal at the end of useful life.

Program Protection Planning. A program protection plan must be prepared for any program that is determined by the program manager to have critical program information that could be exploited to undermine the mission effectiveness of a system. The plan lays out the efforts necessary to prevent inadvertent disclosure and to deny access by foreign intelligence collection activities. It is updated throughout the system life cycle and reviewed at every milestone decision review.

8

THE RESOURCE ALLOCATION PROCESS

The Four Phases of the Process

All resources (dollars) for Department of Defense (DoD) activities, whether for weapons, information systems, people, buildings, or operating and support costs, are provided through the resource allocation process. The four phases of this process are:

- Phase 1 – Planning, Programming, Budgeting and Execution (PPBE) Process
- Phase 2 – Enactment
- Phase 3 – Apportionment
- Phase 4 – Execution

From the standpoint of developing, producing, fielding, and supporting weapon systems, PPBE is the focus of attention in the headquarters activities, while defense acquisition program managers are equally concerned with providing information to ensure their programs are funded for the future, and with the day-to-day management of their programs. Following is a brief discussion of these four phases, which are depicted in Figure 8-1.

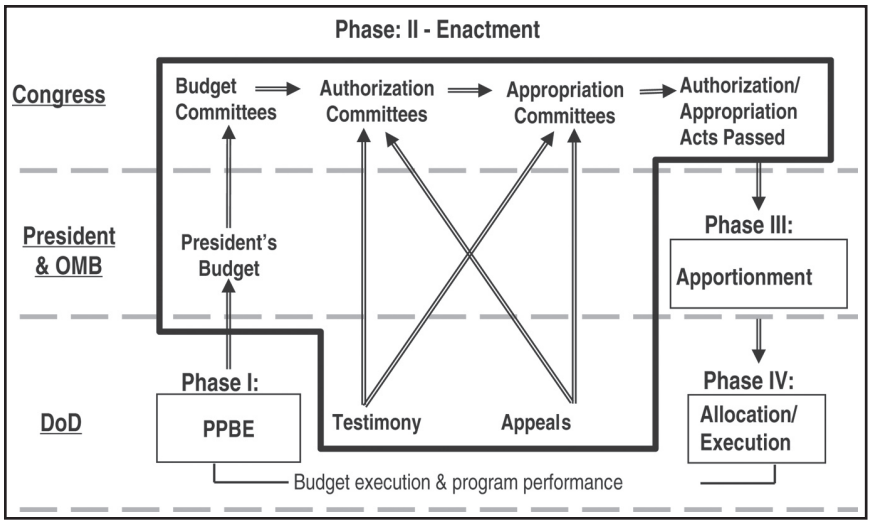

Figure 8-1. Resource Allocation Process

Phase I – Planning, Programming, Budgeting and Execution (PPBE) Process

PPBE is the process that produces DoD's portion of the President's budget. It was originally introduced as the Planning, Programming, and Budgeting System (PPBS) by Secretary of Defense Robert McNamara in 1962. PPBE replaced PPBS in 2003. PPBE is a biennial (2-year) cycle during which DoD formulates 2-year budgets during even numbered calendar years, called the "on-year" and then uses the "off-year" (odd-numbered calendar years) to focus on budget execution and program performance. During the on-year, PPBE produces the Strategic Planning Guidance (SPG) and Joint Programming Guidance (JPG), and a Program Objectives Memorandum (POM) for each military department, defense agency, and selected other agencies/offices. Updates to the Future Years Defense Program (FYDP) occur during both on- and off-years, and a DoD budget is produced every year. During the off-year, the JPG may be issued at the discretion of the SECDEF. Small programmatic adjustments will be allowed during the off-year to reflect real world changes. The chart on the next page shows the agency responsible for each product.

The Deputy Secretary of Defense manages the PPBE process with the advice and assistance of the Senior Leadership Review Group (SLRG), which the Deputy Secretary chairs. The SLRG includes the five Under Secretaries of Defense (Acquisition, Technology and Logistics; Policy;

Activity	OSD Action Office	Product
On Year		
Planning	Under Secretary of Defense (Policy)	Strategic Planning Guidance/Joint Programming Guidance
Programming	Director, Program Analysis & Evaluation	Approved Program Objectives Memoranda (updated FYDP)
Budgeting	Under Secretary of Defense (Comptroller)	DoD Portion of the President's Budget (updated FYDP)
Off-Year		
Planning (as required)	Under Secretary of Defense (Policy)	Joint Programming Guidance (optional)
Program Changes	Director, Program Analysis & Evaluation	Limited Changes to Baseline Program (updated FYDP)
Budget Changes	Under Secretary of Defense (Comptroller)	Limited Changes to Baseline Budget (updated FYDP)

Comptroller/Chief Financial Officer; and Personnel and Readiness (P&R); and Intelligence); the Director, Program Analysis and Evaluation; the Chairman of the Joint Chiefs of Staff (CJCS) and the Vice Chairman of the Joint Chiefs of Staff (VCJCS); and the Secretaries of the Army, Navy, and Air Force.

Off-/On-Year Activities: The Quadrennial Defense Review (QDR) required by Congress is DoD's major statement of defense strategy and business policy. As such, the QDR fulfills the requirement for the DoD Strategic Plan required by the Government Performance and Results Act (GPRA). The QDR integrates and influences all internal programmatic decisions that must be resourced by the President's budget. Since the QDR is only produced every 4 years, this drives PPBE to slightly different off and on-years within a 4-year construct. The following summarizes a typical 4-year period of time that reflects the 2-year cycle of PPBE.

- *Year 1: Off-Year*. The first year of a new Presidential Administration and an off-year (odd numbered calendar year) for PPBE. The budget submitted to Congress has been developed by the outgoing administration, and the budget being executed reflects the policies of the previous administration. Activities during this year may include supplemental budget requests to Congress to start re-orienting spending in accordance with policies of the new administration. Since this is an off-year for PPBE, there will be no POM or Budget Estimate Submit (BES) to the Office of the Secretary of Defense (OSD); however, programmatic and budget changes to the previous on-year baseline will be accomplished. The off-year review typically adjusts the on-year budget and program baseline to reflect changes to budgets and programs and issues that cannot be delayed to the next on-year cycle.

  In the first year of a new administration, the President's National Security Strategy (NSS) must be issued within 150 days of taking office. The NSS will provide top-level guidance for conduct of the QDR, and provide guidance for the CJCS to develop the National Military Strategy (NMS). (A ***National Defense Strategy (NDS)*** is issued by the Secretary of Defense in response to the NSS and provides guidance for the CJCS in developing the NMS and also a more specific foundation for the conduct of the QDR.) The NMS will be reflected in the QDR and in an NMS document. For subsequent years, the NSS is due with the submission of the President's budget. The NMS is updated by the CJCS only when necessary.

  The QDR review will start in the summer/fall of the first year so a QDR report can be provided to Congress concurrent with the submission of the new administration's first budget in February. A program/budget execution review of the prior budget year(s) will be conducted in the fall (September-November), and this activity initializes the drafting of the on-year JPG.

- *Year 2: On-Year.* The second year of a new administration and an on-year (even numbered calendar year) for PPBE. The QDR report is submitted concurrent with the President's budget in February. The OSD staff prepares the ***Strategic Planning Guidance (SPG),*** the "precursor" to the JPG that provides broad guidance in the form of strategic goals, but which may also address specific programs. Through a joint review by OSD, the Joint Staff, the Service headquarters staffs, and the defense agencies, the general guidance in the SPG is translated

into the JPG, which is issued around May followed by a concurrent POM/budget process. The departments and agencies will submit their POM and BES in August. Adjustments will be made in the FYDP, and the DoD input to the President's budget will be finalized. Concurrent with the fall OSD assessment of the POMs and budget estimates, a program/budget execution review of the previous budget execution year will be conducted.

- *Year 3: Off-Year*. The third year of a new administration and another off-year for PPBE. As this is the second off-year, there is no requirement for another QDR, and the issuance of an off-year JPG may not be necessary depending on the national security environment. There will be an NSS issued by the White House; however, update of the NMS is optional—again, this depends on the security environment and if the NSS contains significant new top-level guidance requiring changes in the military strategy. Programmatic and budget changes to the last on-year baseline will result in a new DoD budget. Drafting of the on-year JPG is initialized during the off-year program, budget, and execution review.

- *Year 4: On-Year*. The fourth year of a new administration and another on-year for PPBE. The activities for this year are like those of year 2, above, except there is no QDR.

Phase II - Enactment

Enactment is the process through which the Congress reviews the President's budget, conducts hearings, and passes legislation. Enactment begins when the President submits the annual budget to Congress in early February of each year and ends when the President signs the annual authorization and appropriation bills approximately 9 months later. "Authorization" approves programs and specifies maximum funding levels and quantities of systems to be procured. The "appropriations process" provides the budget authority with which to incur obligations (i.e., obligate) and expend and outlay funds.

Phase III - Apportionment

Once the authorization and appropriations legislation is signed into law by the President, funds are made available for DoD and other federal agencies. "Apportionment" occurs when the Office of Management and Budget

provides these funds to DoD and other federal agencies. Subsequently, DoD allocates funds within the department through action by the Under Secretary of Defense (Comptroller) and counterparts in the Services and defense agencies.

Phase IV - Execution

The execution phase occurs when appropriated funds are spent on defense programs. In other words, it is the process of "obligating" funds (awarding contracts) and "expending" funds (writing checks to pay bills). Outlays occur when government checks are cashed and money flows out of the U.S. Treasury. The four phases of the resource allocation process overlap (see Figure 8-2).

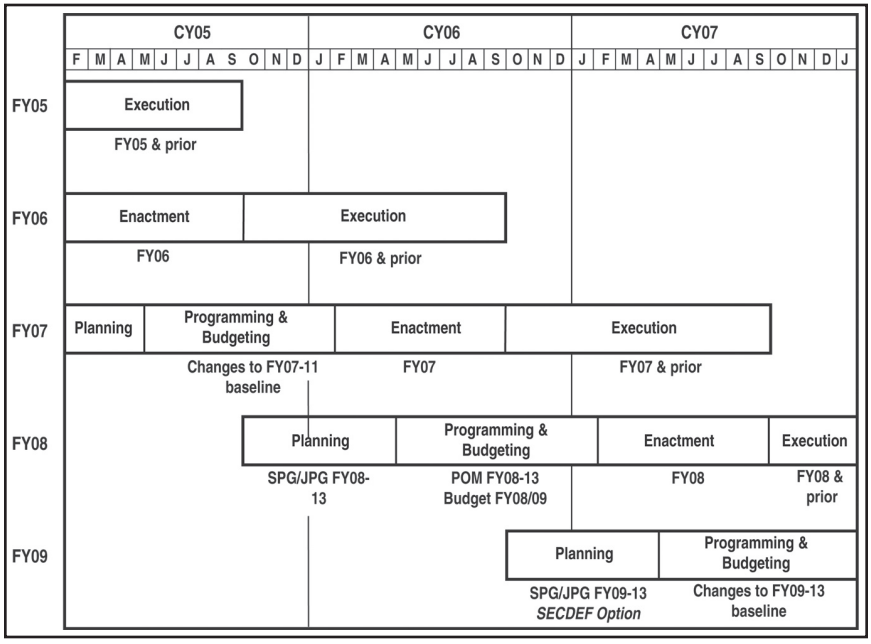

Figure 8-2. Resource Allocation Process – Overlap

The current fiscal year budget is being executed while enactment of next year's is underway, and programming for the following budget is in process. Planning is essentially a continuous process.

It is incumbent on program managers and other officials responsible for any aspect of the resource allocation process to be aware of the sequence of activities and to understand where they are at all times. Note PPBE is a *calendar*-driven system and that the acquisition life cycle is *event*-driven. Avoiding a mismatch or disconnect between programmatic requirements and available funding demands close attention on the part of program managers. This may be the most challenging part of a program manager's job, and if not managed carefully, can become the greatest single source of program instability.

INTERNET WORLD WIDE WEB LOCATIONS

For readers who wish to follow up with additional study on the defense acquisition system, the following list of Uniform Resource Locators (World Wide Web sites) for the major organizations and documents mentioned in this guidebook may be helpful. (Addresses are current as of the publication date of this guidebook.)

Organization/Document	WWW Location
Acquisition, Technology and Logistics Knowledge Sharing System	http://akss.dau.mil
Acquisition Community Connection	https://acc.dau.mil
Assistant Secretary of the Army (Acquisition, Logistics and Technology), the Army Acquisition Executive	http://webportal.saalt.army.mil
Assistant Secretary of the Air Force (Acquisition), the Air Force Acquisition Executive	https://www.safaq.hq.af.mil.indexpub.html (available from .mil address only)
Assistant Secretary of the Navy (Research, Development and Acquisition), the Navy and Marine Corps Acquisition Executive	http://www.hq.navy.mil/RDA
Assistant Secretary of Defense, (Networks and Information Integration) the DoD Chief Information Officer	http://www.dod.mil/nii
Advanced Concept Technology Demonstration (ACTD)	http://www.acq.osd.mil/actd
Defense Acquisition Policy Center (for DoD 5000 series and JCIDS directives)	http://akss.dau.mil/darc/darc.html
Defense Acquisition University	http://www.dau.mil
Defense Acquisition University Continuous Learning Center	http://clc.dau.mil

Organization/Document	WWW Location
Defense FAR Supplement (DFARS)	http://www.acq.osd.mil/dpap/dars/dfars
Director, Operational Test & Evaluation	http://www.dote.osd.mil
Director, Program Analysis & Evaluation	http://www.pae.osd.mil
Federal Acquisition Regulation (FAR)	http://farsite.hill.af.mil
Chairman, Joint Chiefs of Staff Electronic Library	http://www.dtic.mil/cjcs_directives
Office of the Secretary of Defense	http://www.defenselink.osd.mil
Under Secretary of Defense (Acquisition, Technology and Logistics)	http://www.acq.osd.mil

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