DEFENSE ACQUISITION UNIVERSITY

INTRODUCTION TO DEFENSE ACQUISITION MANAGEMENT

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AUTHOR: BRADFORD BROWN

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INTRODUCTION TO DEFENSE ACQUISITION MANAGEMENT

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PREFACE

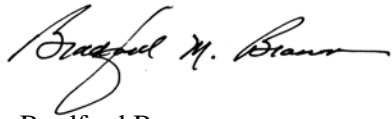
This tenth edition of *Introduction to Defense Acquisition Management* includes revisions to the regulatory framework for Defense systems acquisition from the December 2008 Department of Defense Instruction 5000.02, the Weapons System Acquisition Reform Act of 2009, and the July 2009 version of the Joint Capabilities Integration and Development System Manual. This edition also reflects the 2010 change from a biennial to an annual Planning, Programming, Budgeting and Execution process.

This publication is designed to be both an 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, not on the details of any specific defense system.

The document is based on numerous source documents. For the reader who wishes to dig deeper into this complex area, a list of Web site addresses is provided after the last chapter.

Every attempt has been made to minimize acronyms. Commonly used acronyms 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. Initial capitalization has been kept to a minimum to increase readability.

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



Bradford Brown
Director, Center for Acquisition and
Program Management
Learning Capabilities Integration Center
Defense Acquisition University

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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 5000.01)*

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, only one of the many functions performed as part of the acquisition process. For example, many things required by DoD, such as passenger vehicles, office supplies, and waste removal, are "procured"; however, they are not subject to the full range of regulatory oversight inherent in the acquisition process for weapons, information technology systems, and supporting services, so they are not described in this publication.

Acquisition programs are directed and funded efforts designed to provide a new, improved, or continuing materiel,[1] weapon or information system, or services 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.

Services refer to those contractor services that support and enhance the warfighting capabilities of DoD, such as advisory and assistance services.

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 • Logistic 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* (PM) is the individual within DoD chartered to manage an acquisition program. 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 CONGRESS, THE EXECUTIVE BRANCH, AND INDUSTRY IN DEFENSE ACQUISITION

At the national level, three major top-level participants in defense acquisition are the Executive Branch, Congress, and the 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 are the President, the Office of Management and Budget, the National Security Council, and DoD. Chapter 5 contains a more detailed discussion of organizations and positions below this top level. The chart below characterizes the perspectives, responsibilities, and objectives of the Executive Branch:

Perspectives	Responsibilities	Objectives
• Formulate, direct and execute national security policy • Patriotism • Personal ambition • Re-election	• Sign legislation into law (President) • Serve as Commander-in-Chief (President) • Negotiate with Congress • Make decisions on major defense acquisition programs (the Under Secretary of Defense for 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

Legislative Branch

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 Congress; the Congressional Budget Office; and

the Government Accountability Office. The chart below characterizes the perspectives, responsibilities, and objectives of the Congress:

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

American Industry

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

Perspectives	Responsibilities	Objectives
• Stockholders' 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, 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 PMs. Figure 1-1 illustrates some of the interrelationships among these key players. This figure also shows the PM 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.

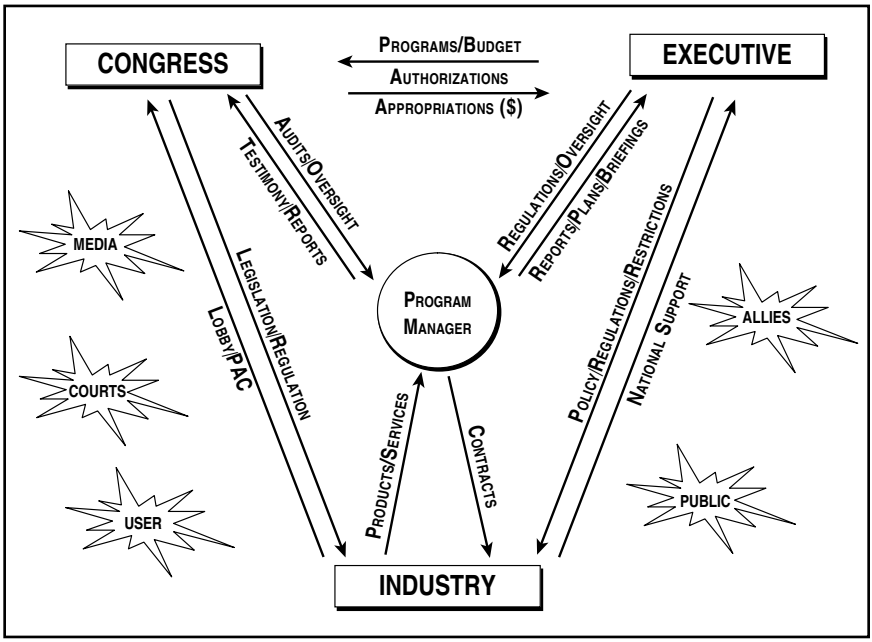

Figure 1-1. The Program Manager's Environment

SUCCESSFUL DEFENSE ACQUISITION PROGRAM

A successful defense acquisition program places a capable and supportable system in the hands of users (the warfighter or those who 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. Depending on your perspective, "success" can take many different forms.

- For the *PM*, 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 *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 SYSTEMS ACQUISITION

The authority for DoD to conduct defense systems 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 enforce and facilitate the law and to 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 defense systems acquisition follow:

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

- *Competition in Contracting Act* (1984)

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

- *Government Performance and Results Act* (1993)

- *Federal Acquisition Streamlining Act of 1994*

- *Weapon Systems Acquisition Reform Act of 2009*

- *Annual authorization and appropriations legislation*, which may contain substantial new or amended statutory requirements (like the FY2006 requirement for certification of major defense acquisition programs prior to program initiation).

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 as well as other agency regulations. 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* (updated annually) 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

DEFENSE SYSTEMS ACQUISITION IN THE 21ST CENTURY

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

> *Likely adversaries can be expected to pursue and adopt any methods and means that confer an advantage relative to U.S. military power -- including methods that violate widely accepted laws and conventions of war. Even an advanced military power can be expected to adopt some methods considered "irregular" by Western standards, while nonstate actors increasingly are acquiring and employing "regular" military capabilities. Rather than attempting to defeat U.S. forces in decisive battle, even militarily significant states are likely to exploit increasingly inexpensive but lethal weapons in an erosion strategy aimed at weakening U.S. political resolve by inflicting mounting casualties over time.*[2]

The 2008 *National Defense Strategy* stresses the importance of winning the Long War.

> *For the foreseeable future, winning the Long War against violent extremist movements will be the central objective of the U.S. ... Success in Iraq and Afghanistan is crucial to winning this conflict, but it alone will not bring victory. We face a clash of arms, a war of ideas, and an assistance effort that will require patience and innovation.*[3]

[2] *Capstone Concept for Joint Operations, v3.0*, Chairman of the Joint Chiefs of Staff, 15 Jan 2009. Available at <http://www.dtic.mil/futurejointwarfare/concepts/approved_ccjov3.pdf.

[3] *National Defense Strategy*, Secretary of Defense Robert M. Gates, June 2008.

IMPROVING HOW DOD DOES BUSINESS

Quadrennial Defense Review (QDR) 2010 focused on four specific issues where reform in how the Department does business is imperative: energy security, climate change, security assistance, the defense industrial base, and defense acquisition. These four areas are summarized from the QDR report here:[4]

Energy Security. The Department needs assured access to reliable supplies of energy to meet operational needs. As a force multiplier energy efficiency increases the range and endurance of forces in the field while reducing the combat forces diverted to protect energy supply lines. DOD will consider the fully burdened cost of delivered energy early in the acquisition process during studies to analyze alternatives to meeting future warfighting requirements. In 2010 a Director of Operational Energy Plans and Programs was created in the office of the Under Secretary of Defense for Acquisition, Technology and Logistics. Operational energy means the energy required for training, moving, and sustaining military forces and weapons platforms for military operations. The Director is responsible for establishing an operational energy strategy and oversight of operational energy plans and programs within the Department.

Climate Change. Climate change will impact on DOD in two major areas. First, it may increase instability or conflict requiring responses from civilian institutions and militaries around the world. Extreme weather events may lead to increased demands for defense support to civil authorities for humanitarian assistance or disaster response both within the United States and overseas. DOD has environmental security cooperative initiatives with foreign militaries that represent a nonthreatening way of building trust and developing response capacity. Second, DOD must adjust to the impacts of climate change on facilities and military capability. Operational readiness depends on access to land, air and sea training and test areas. More than 30 military installations are already facing elevated levels of risk from rising sea levels. DoD will reevaluate climate change risk on a regular basis and develop policies and plans to mitigate its effects on the operating environment, missions and facilities.

Security Assistance. Future threats to national security are more likely to come from state weakness than from state strength. Enabling international

[4] *Quadrennial Defense Review Report to Congress, Secretary of Defense Robert M. Gates, February 2010.*

partners to respond to security challenges may reduce risk to U.S. forces. The Department is taking steps to improve the process of implementing foreign military sales to make the requirements, definition, and procurement processes more efficient.

Strengthening the Industrial Base. America's industrial strength made victory in World War II possible, maintained a technological edge against the Soviet Union during the Cold War, and continues to provide the world's best warfighting equipment. The defense industrial base has gone through a metamorphosis since the end of the Cold War in 1991. Weaker competitors have merged with stronger companies or have dropped out of the market. For example, in 1982 there were 10 major U.S. producers of fixed wing military aircraft. Today there are only three: Boeing, Lockheed Martin, and Northrop Grumman.

The Department recognizes that the defense industrial base does not just consist of a few well established large defense contractors. In fact, the goods and services the Department relies on reach deeply into the overall U.S. economy. The Department intents to establish requirements and pursue programs that take advantage of the full spectrum of the industrial base: defense firms, purely commercial firms, and technologically advanced firms and institutions that fall somewhere in between.

Defense Acquisition. The QDR identified four major problems in DOD's ability to acquire military capabilities in a timely and affordable manner: 1) Requirements for new systems too often reflect the far limits of current technology, and requirements that continue to increase throughout a program's life cycle (sometimes referred to as "requirements creep"). 2) The acquisition workforce lacks the trained personnel in the areas of cost estimators, systems engineers and acquisition managers. This causes problems in the conduct of effective oversight. 3) The acquisition process too often encourages overly optimistic cost estimates. Underestimating cost is likely to result in too many programs chasing too few dollars, and cost threshold breaches requiring program terminations and increased reporting to Congress. 4) Improvements are needed in the effective and efficient delivery of logistical support to the fighting forces in the field. The next section deals with some of the initiatives to help solve or mitigate the impact of these problems and other areas of concern with the defense acquisition process.

INITIATIVES TO IMPROVE DEFENSE ACQUISITION

Requirements Management Certification Training. Section 801 of the National Defense Authorization Act for Fiscal Year 2007, required the Under Secretary of Defense for Acquisition, Technology and Logistics, in consultation with the Defense Acquisition University, to develop a training program to certify military and civilian personnel of DoD with responsibility for generating requirements. This resulted in a training program for requirements managers consisting of a number of web-based continuous learning modules, a one-week classroom course, and a one-day workshop for general/flag officers and senior executive service civilians. To access courses for requirements and acquisition training see the list of web sites at the end of this booklet.

Technology Readiness Assessments. Critical technologies required to meet warfighter requirements must be "mature" before system development begins. For technology to be considered mature, it must have been applied in a prototype article, tested in a relevant or operational environment, and found to have performed adequately for the intended application. Technology Readiness Assessments are used by DOD before a new acquisition program is started, and during development to verify technology maturity to standards established by Department policy and the Congress.

Configuration Steering Boards. To help control requirements creep during development, the Military departments have established Configuration Steering Boards for ACAT I (see Chapter 4) programs in development. The boards will review all requirements changes and any significant technical configuration changes that have the potential to result in cost and schedule impacts to the program. Such changes will generally be rejected, deferring them to future blocks or increments. Changes may not be approved unless funds are identified and schedule impacts mitigated.

Competition and Prototyping. Revisions to acquisition policy in 2008 and requirements of public law enacted in 2009 require competitive prototyping by two or more competing teams during the technology development phase of the acquisition process. The intent of this policy is to rectify problems of inadequate technology maturity and a lack of understanding of the critical program development path. This initiative will help ensure technology maturity prior to Milestone B and facilitate the ability of the Milestone Decision Authority to certify that the technology in the program has been demonstrated in a relevant environment.

Fuel Efficiency of Weapons Platforms. Requirements for weapons systems must include fuel efficiency considerations and include operational fuel demand and fuel logistics resupply risk with a focus on mission success and mitigations on the size of the fuel logistics force within the operational planning scenario. The Department is also taking steps to develop and provide program executive officers and program managers more tangible incentives, actionable requirements, guidance, and analytical tools to make better-informed decisions concerning technology investments and design decisions affecting the fuel demand of their programs without negatively impacting performance requirements.

Cost Estimates. The Office of the Secretary of Defense Director, Cost Assessment and Program Evaluation will conduct an independent cost estimate and cost analyses for major defense acquisition programs for which the Under Secretary of Defense for Acquisition, Technology and Logistics is the milestone decision authority. This independent cost estimate will be conducted in advance of program certifications prior to Milestones A and B, prior to any decision to enter low rate initial production or full rate production, and at any other time considered appropriate by the Director or the Under Secretary. The Director will also conduct an independent cost estimate for major automated information system acquisition programs when the Under Secretary is the decision authority and the program has experienced a critical change requiring a report to Congress.

Root Cause Analyses. The Director, Root Cause Analysis, in the office of the Under Secretary of Defense for Acquisition, Technology and Logistics conducts performance assessments for major defense acquisition programs periodically or when requested by the Secretary of Defense, the Under Secretary of Defense for Acquisition, Technology and Logistics, the Secretary of a Military Department, or the head of a Defense Agency. Performance assessments shall evaluate the cost, schedule, and performance of the program, relative to current metrics, performance requirements, and baseline parameters. The assessments will determine the extent to which the level of program cost, schedule, and performance relative to established metrics is likely to result in the timely delivery of a level of capability to the warfighter.

Logistics Support Improvements. A detailed review of key elements of sustainment planning for all programs overseen by the Defense Acquisition Board will be conducted at each milestone decision and other review points. The Program Manager will report on the program's product support strategy, to include the sustainment approach, issues such as short-

falls in operations and maintenance funding, status of reliability, availability and other sustainment metrics vs. goals, and operations and support cost estimates against the acquisition program baseline and reports to Congress.

Better Buying Power. While the defense budget is not expected to decline it is also not expected to enjoy the large rate of growth experienced during the years after the terrorist attacks on September 11, 2001. This Secretary and Deputy Secretary of Defense efficiency initiative requires the Department to reduce funding devoted to unneeded or low-priority overhead, and to transfer those funds to force structure and modernization so that funding for warfighting capabilities grows at approximately three percent annually. In other words, "do more without more."

Acquisition Workforce Enhancements. In April 2009, the Secretary of Defense announced a major DOD strategy to revitalize the Defense Acquisition Workforce, to include increasing its size by 20,000 by FY2015—the most significant workforce initiative in the history of the federal government. The plan for executing this initiative, the DoD Acquisition Strategic Workforce Plan, was provided to Congress in April, 2010 and is a part of DoD's High Priority Performance Goals included in the President's FY2011 Budget. The plan is available at https://acc.dau.mil/acquisitionworkforce.

These and other initiatives are being implemented throughout the Department. These initiatives will help the United States acquire quality defense systems faster and at an affordable cost—and this is essential if this country is to maintain the world's best warfighting forces. The cultural shifts in the acquisition process are characterized by the following chart:

Changes in Emphasis	
Focus of Acquiring Defense Systems in the 20th Century	**21st Century Changes in Emphasis**
• Many new systems • Global nation-state threats • Technology-driven systems • Military-service unique programs • Military-unique technology • Technology development	• Fewer new systems; modified legacy systems • Regional asymmetric threats • Affordability-driven systems • Joint programs • Commercial and dual-use technology • Technology insertion

3

PROGRAM MANAGEMENT IN DEFENSE ACQUISITION

Department of Defense (DoD) policy requires that a program manager[5] be designated for each acquisition program. The role of the PM 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 PM's acquisition executive (see Chapter 5). The PM'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.

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 MANAGER

> *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 5000.01)

[5] The title *program manager* is used broadly here. Some DoD components may use different titles, such as *program director, project manager, product manager,* and others.

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[6] that must work together to achieve program goals.

Program Manager's Perspective

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

- 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, 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;
- 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.

[6] *Functional disciplines* refer to business and financial management, logistics, systems engineering, software management, test and evaluation, manufacturing management, and others.

Why is Program Management Used in Defense Acquisition?

Program management provides for a single point of contact, the PM, who is the major force for directing the system through its evolution, including design, development, production, deployment, operations and support, and disposal. The PM, while perhaps being unable to control the external environment, has management authority over business and technical aspects of a specific program. The PM has one responsibility only—managing the program—and accountability is clear. The 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 the functional disciplines that have a stake in program success, 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, such as a "test integrated product team." Following contract award, program-level integrated product teams often include contractor participation.

DoD has recognized the importance of integrated product teams as a means to aid the PM and as a way to streamline the decision process. With the use 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 PM capitalizes on the strengths of all the stakeholders in the defense acquisition system.

4

DEPARTMENT OF DEFENSE ACQUISITION POLICY

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

DoD Directive 5000.01

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 5000.02

Operation of the Defense Acquisition System—approved by the Under Secretary for Acquisition, Technology and Logistics (USD[AT&L]), the Assistant Secretary of Defense for Networks and Information Integration, and the DoD Director for 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 5000.02 establishes a general approach for managing all defense acquisition programs while authorizing the program manger and the milestone decision authority to exercise discretion and prudent business judgment to structure a tailored, responsive, and innovative program. The Defense Acquisition University groups oversight of the acquisition process into three major decision-support systems: the Joint Capabilities Integration and Development System (JCIDS); the Defense Acquisition System; and the Planning, Programming, Budgeting and Execution (PPBE) process (as depicted in Figure 4-1 on the next page).

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

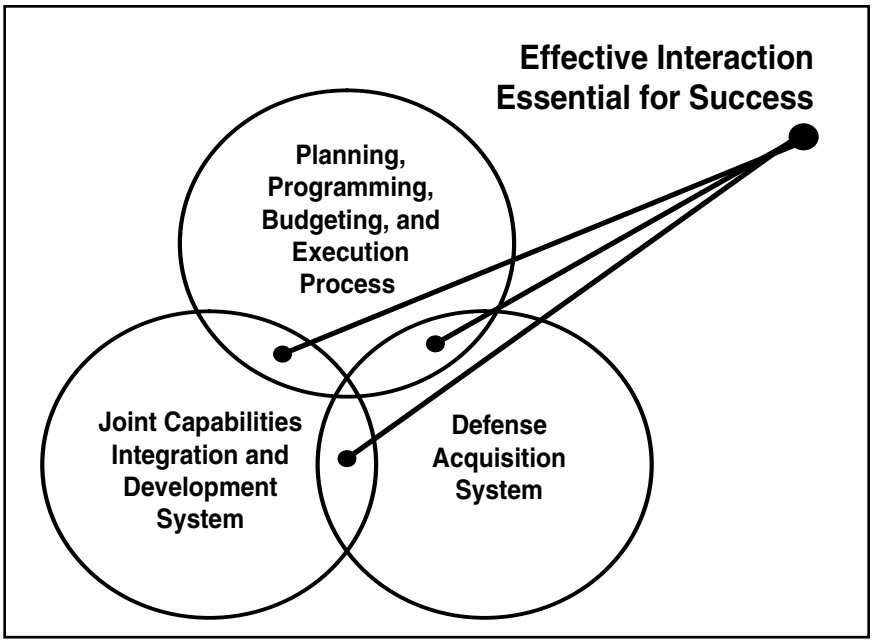

Figure 4-1. Three Major Decision-Support Systems

allocation of scarce resources. These decision-support systems are discussed in Chapters 6, 7, and 8, respectively.

The *Joint Capabilities Integration and Development System*, governed by the Chairman of the Joint Chiefs of Staff Instruction 3170.01, 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 the DoD Financial Management Regulation DoD 7000.14-R, prescribes the process for making decisions on funding for every element of the Department, including acquisition programs.

Category	Criteria for Designation	Decision Authority
ACAT I	• Major Defense Acquisition Programs - RDT&E total expenditure of more that $365M, or - Procurement total expenditure of more than $2.190B • MDA designation as special interest	• ACAT ID: USD(AT&L) - Reviewed by the Defense Acquisition Board (DAB) • ACAT IC: Component head, or Component Acquisition Executive (CAE) (cannot be further delegated) - Reviewed by component HQ
ACAT II	• Does not meet ACAT I criteria • Major System - RDT&E total expenditure of more than $140M, or - Procurement total expenditure of more than $660M • MDA designation	• CAE or the individual designated by the CAE • Reviewed in accordance with component policy
ACAT III	• Does not meet ACAT II or above criteria	• Designated by the CAE at the lowest appropriate level • Reviewed in accordance with component policy

Figure 4-2. Acquisition Categories, Weapons Systems (amounts in FY2000 constant dollars)

ACQUISITION CATEGORIES

For management purposes, all defense acquisition programs fall into one of the acquisition categories (ACATs) shown in Figures 4-2 and 4-3. The ACAT level is principally based on dollar value and level of milestone decision authority. The chain of authority and organizational players affecting various ACATs are discussed in Chapter 5.

Weapons Systems. The ACAT designations for weapons systems are shown in Figure 4-2. Weapons systems typically include weapons and support equipment (like trucks); and command, control, communications, intelligence, and surveillance systems.

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

- *ACAT ID*. The milestone decision authority is the 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 milestone decision authority is the Component Acquisition Executive (CAE). The "C" refers to component[7]. Each component has its own process for headquarters review of these programs prior to a milestone decision by the CAE.

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 milestone decision authority for these programs is also the CAE. 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 milestone decision authority is designated by the CAE. 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 Center (Air Force) level.

In addition to the three ACATs shown here, the Department of the Navy also uses an ACAT IV designation. Navy or Marine Corps Program Executive Offices, commanders of the Systems Command, and direct-reporting program managers (PMs) designate ACAT IV programs and may delegate milestone decision authority for such programs to a designated flag officer, Senior Executive Service official, or to the PM.

Automated Information Systems. ACAT designations for automated information systems are shown in Figure 4-3. An automated information system is a system of computer hardware, software, data, or telecommunications that performs functions such as collecting, processing, storing, transmitting, and displaying information. Excluded are computer resources that are part of a weapon system or a highly classified program.

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

[7] *DoD components* are the military departments, defense agencies, and unified commands.

Category	Criteria for Designation	Decision Authority
ACAT IA	• Major Automated Information System (MAIS) – Designated by the MDA as an MAIS, or – Estimated to exceed: ▪ Program costs in any single FY (all appropriations), $32M, or ▪ Total program costs (all appropriations) from beginning of Concept Refinement through deployment at all sites, $126M, or ▪ Total life cycle costs (all appropriations), $378M • MDA designation as special interest	• ACAT IAM: – USD(AT&L) or designee – Reviewed by the Information Technology Acquisition Board • ACAT IAC: Component head, or Component Acquisition Executive (CAE) (cannot be further delegated) - Reviewed by component HQ
ACAT II	• Does not apply to MAIS programs	• N/A
ACAT III	• Does not meet ACAT IA (MAIS) criteria	• Designated by the CAE at the lowest appropriate level • Reviewed in accordance with component policy

Figure 4-3. Acquisition Categories, Automated Information Systems (amounts in FY2000 constant dollars)

- *ACAT IAM*, for which the milestone decision authority is the USD(AT&L) or, if delegated, the Assistant Secretary of Defense for Networks and Information Integration. The "M" refers to major automated information systems reviewed by the Information Technology Acquisition Board.

- *ACAT IAC*, for which the milestone decision authority is delegated to the component. The "C" refers to component. After the appropriate headquarters review, the CAE makes the final milestone decision.

The *ACAT II* designation does not apply to automated information sys-

tems. *ACAT III* automated information systems are those that do not meet the criteria for ACAT IA.

DOD SPACE SYSTEMS ACQUISITION PROCESS

Interim Guidance for DoD Space System Acquisition Process, March 23, 2009[8], 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 DoDI 5000.02 mentioned earlier, with slightly different terms and streamlined processes appropriate for high-technology, small-quantity space systems. The USD(AT&L) is the DoD Space Milestone Decision Authority (MDA) for all DoD Space Major Defense Acquisition Programs.

DEFENSE ACQUISITION PORTAL

In addition to the regulatory documents mentioned throughout this pamphlet, the Defense Acquisition Portal (DAP) can be accessed at <https://dap.dau.mil>. The DAP, with links to acquisition-related communities of practice, acquisition commands/organizations, and valuable reference material, provides a complete Web-based source of information for the acquisition community.

[8] The USD(AT&L) is expected to issue a Directive-Type Memorandum (DTM) for Space Systems Acquisition in mid-2010. The DTM will replace the Interim Guidance and will be incorporated into DoDI 5000.02.

5

DEFENSE ACQUISITION SYSTEMS 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 then-President Reagan in early 1986, the Packard Commission recommended the creation of a single top-level Defense Acquisition Executive responsible for the defense acquisition process, the Under Secretary of Defense for Acquisition, Technology and Logistics (USD[AT&L]), and establishment of a streamlined reporting chain from program managers (PMs) 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 then-President George Bush in 1989. The report of the Defense Management Review reiterated the Packard Commission findings and reinforced the importance of the streamlined reporting chain for all PMs. This reporting chain provides for no more than two levels of management oversight between the PM and the milestone decision authority 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 USD(AT&L), through Component Acquisition Executives and Program Executive Officers (PEOs), to the individual PMs of ACAT ID and ACAT IAM programs.

Program Executive Officers

The position of PEO was established in 1986 based on the Packard Commission Report. A PEO is typically a general officer or Senior Executive Service (SES) civilian equivalent responsible for the first-line supervision of a group of like programs, each managed by a PM. Examples are the Army's PEO for Ground Combat Systems, the Navy's PEO for Tactical Aircraft Programs, and the Air Force's PEO for Combat and Mission Support. The number of PEOs varies by Service and over time, but typically, the Services have between 5 and 12 PEOs at any one time. Current policy provides that PEOs may not have any other command responsibilities unless a waiver is obtained from the USD(AT&L). The Army and the Air Force have obtained waivers and, in some cases, have dual-hatted the commanders of their respective acquisition commands as PEO.

Acquisition Program Reporting

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

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 re-delegation. In the military departments, the secretaries have delegated this responsibility to the assistant secretary level, commonly called the Service Acquisition Executives (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 appropriate secretary administratively and to the USD(AT&L) for acquisition management matters. Each SAE also serves as the senior procurement executive for his or her military department. In this capacity, the SAEs are responsible

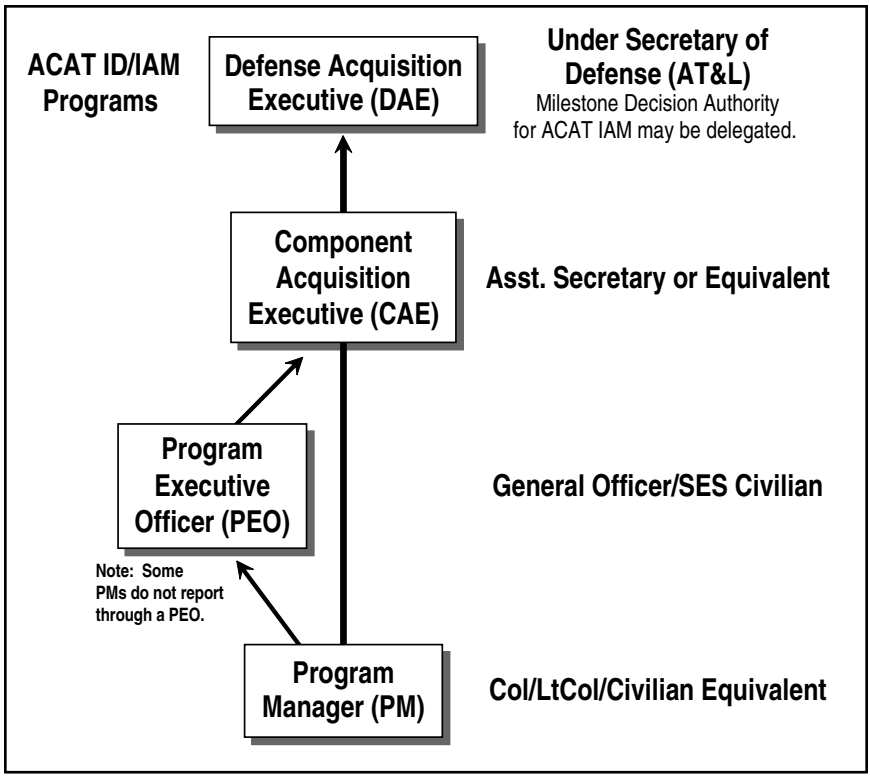

Figure 5-1. DoD Acquisition Authority Chain

for management direction of their respective Service procurement system. Many of the defense agencies and some of the combatant commands also have acquisition executives.

ACAT ID and ACAT IAM 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.

Component Chief Information Officers

The DoD components each have chief information officers (CIOs) who provide advice and assistance to the CAE for the oversight and review of automated information systems acquisition programs.

Direct-Reporting Program Managers

Some PMs do not report to a PEO but instead report directly to the CAE. These direct-reporting PMs are typically one- or two-star officers or SES civilian equivalents who manage priority programs of such a nature that direct access to the CAE is deemed appropriate. An example is the Department of the Navy's PM for Strategic Systems.

Under Secretary of Defense for Acquisition, Technology and Logistics

Title 10, United States Code, §133, authorizes the position of 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) also establishes policy for the training and career development of the Defense Acquisition Workforce.

The organization of the Office of the USD(AT&L) has changed over time to reflect the policies of the President and the Secretary of Defense. Currently, the office has the following major subordinate staff elements.

- *Assistant Secretary of Defense for Acquisition*: Oversees acquisition and contracting policy, and provides oversight for major defense acquisition programs. The ASD(A) supervises the following:

    - Director, Industrial Policy;
    - Director, Small Business Programs;
    - Director, Portfolio Systems Acquisition;
    - President, Defense Acquisition University;
    - Director, Defense Contract Management Agency; and
    - Director, Space and Intelligence Office.

- *Director, Defense Research and Engineering*: Principal advisor to the USD(AT&L) for scientific and technical matters, and supervises the following:

- Director, Plans and Programs;
- Director, Rapid Fielding;
- Director, Research;
- Director, Systems Engineering;
- Director, Developmental Test and Evaluation;
- Director, Defense Advanced Research Projects Agency;
- Director, Defense Technical Information Center.

- *Assistant Secretary of Defense for Logistics and Materiel 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 Materiel Readiness;
  - Assistant Deputy Under Secretary for Program Support;
  - Director, Defense Logistics Agency.

- *Assistant to the Secretary of Defense, Nuclear, Biological and Chemical Defense Programs*: 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.

- *Director, Performance Assessment and Root Cause Analysis*: Conducts performance assessments for major defense acquisition programs periodically or when requested by the Secretary of Defense, the Under Secretary of Defense for Acquisition, Technology and Logistics, the Secretary of a Military Department, or the head of a Defense Agency. Performance assessments shall evaluate the cost, schedule, and performance of the program, relative to current metrics, performance requirements, and baseline parameters. Also, oversees the earned value management (EVM) system.

- *Director, Missile Defense Agency*: The Missile Defense Agency's mission is to develop an integrated ballistic missile defense system to defend the United States. The director is the acquisition executive for all ballistic missile defense programs and systems. PMs report directly to the director, who is the milestone decision authority for programs and systems in development.

- *Deputy Under Secretary of Defense for Installations and Environment*: Provides installation assets and services necessary to support the military forces in a cost-effective, safe, sustainable, and environmentally sound manner.

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

- Director, Defense Procurement and Acquisition Policy;
- Director, Corrosion Policy and Oversight;
- Director, Operational Energy Plans and Programs;
- Director, Human Capital Initiatives (also serves as president, DAU);
- Director, International Cooperation;
- Director, Acquisition Resources and Analysis;
- Director, Test Resource Management Center;
- Director, Administration;
- Executive Director, Defense Science Board;
- Director, Special Programs;
- Director, Missile Defense Agency.

Some of the above-listed officials deal with PMs, PEOs, and CAEs 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; provides the chair of the Defense Acquisition Policy Working Group that oversees the DoD 5000 series of acquisition regulations.

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

- *Director, Portfolio Systems Acquisition*: 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.

- *Director, Systems Engineering*: Approves systems engineering plans for ACAT ID programs and provides policy and oversight of systems

engineering activities within the departments and agencies.

- *Director, Developmental Test and Evaluation:* Develops policies and procedures for Developmental Test and Evaluation (DT&E), and reviews Test and Evaluation Master Plans (TEMPs) for compliance.

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

- *Assistant Secretary of Defense for Networks and Information Integration/DoD Chief Information Officer*: The ASD(NII)/DoD CIO is the principal staff assistant and advisor to the Secretary of Defense and Deputy Secretary of Defense on networks and network-centric policies and concepts; command and control; communications; non-intelligence space matters; enterprise-wide integration of DoD information matters; information technology, including national security systems; information resources management; spectrum management; network operations; information systems; information assurance; positioning, navigation, and timing policy, including airspace and military air traffic control activities; sensitive information integration; contingency support and migration planning; and related matters. When delegated by the USD(AT&L), the ASD(NII) chairs the Information Technology Acquisition Board (ITAB) and makes milestone decisions on ACAT IAM programs.

- *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 to the Secretary of Defense, the USD(AT&L), and the Senate and House Committees on Authorizations and Appropriations as to whether test results on selected ACAT I programs indicate the system is operationally effective and suitable. This office also provides 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.

Several boards/councils are key players in defense systems acquisition:

Defense Acquisition Board

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 to assess readiness to proceed into the next. The DAB is issue-oriented. Typical issues addressed 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. The USD(AT&L) chairs the DAB and the co-chair of the DAB is the Vice Chairman of the Joint Chiefs of Staff.

Information Technology Acquisition Board

The ITAB advises the USD(AT&L) on critical acquisition decisions for ACAT IAM programs. The USD(AT&L) may delegate the responsibility for chairing the ITAB for selected ACAT IAM programs to the ASD(NII). An ADM documents the decision(s) resulting from the review.

Joint Intelligence Acquisition Board (JIAB)

For National Intelligence Program-funded programs executed within DoD, the JIAB is co-chaired by the Deputy Director for National Intelligence for Management and the USD(AT&L). The intelligence community acquisition model is very similar to DoD's (see Intelligence Community Policy Guidance 105.1). The JIAB members include representatives from the DoD chief information officer for information technology architecture and information integration; and the Joint Staff, J-8, for requirements; and may call upon others like the Component Acquisition Executives for advice.

Joint Requirements Oversight Council (JROC)

The JROC leads the Joint Staff in developing policies and procedures for determining warfighting capability needs, and validates and approves these needs for ACAT I and ACAT IA programs that have a potentially significant impact in allied and coalition operations. The JROC is chaired by the Vice Chairman of the Joint Chiefs of Staff. Members are the vice chiefs of staff of the Army and Air Force, the Vice Chief of Naval Operations, and the Assistant Commandant of the Marine Corps. The JROC is assisted in its duties by the Joint Capabilities Board (JCB). The JCB validates and approves ACAT II and below programs that affect joint warfighting and require an expanded joint staff review.

INTEGRATED PRODUCT TEAMS

The defense integrated product team (IPT) concept was adapted from commercial business to streamline an antiquated, inefficient, stovepiped process. IPTs 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 (WIPTs) at the headquarters of the military department. The following paragraphs discuss the roles and responsibilities of these IPTs.

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

OIPT members include the PM, the PEO, 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 milestone decision authority.

Working-Level Integrated Product Teams: WIPTs are formed at the Pentagon-level military department headquarters. They meet as required to help the PM with planning and preparation for OIPT reviews, and to help resolve issues. The leader of each WIPT is usually the PM or the

PM's representative. While there is no one-size-fits-all approach, there are three basic tenets to which WIPT's must adhere:

- The PM is in charge of the program.
- IPTs are advisory bodies to the PM.
- 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 following examples of WIPTs are offered as illustrations:

Test Strategy Integrated Product Team: The purpose of this IPT is to assist in outlining the test and evaluation master plan for a major program. The objective of such an IPT 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 test and evaluation master plan that is acceptable to all organizational levels when first presented.

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 with user community representation.

The PM 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.

COMPONENT-LEVEL OVERSIGHT

Each military service and defense agency has its own oversight and review process that parallels the DAB and IT OIPT processes. These processes are used for managing ACAT IC, ACAT IAC, and ACAT II programs; and for reviewing ACAT ID and 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 chairs. ACAT III and IV programs are reviewed in a similar fashion by the PEOs 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/Gate Reviews (Navy and Marine Corps)	• Assistant Secretary of the Navy (Research, Development and Acquisition)
• Acquisition Strategy Panels/Air Force Review Boards	• 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 and to develop requirements for weapons systems to close those gaps. This process is called the Joint Capabilities Integration and Development System (JCIDS). The primary objective of the JCIDS process is to ensure the capabilities required by the joint warfighter to successfully execute the missions assigned to them are identified with their associated operational performance criteria. 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. The Chairman of the Joint Chiefs of Staff (CJCS) 3170 series and the JCIDS Manual provide policy and procedures for identifying, describing and justifying the needs for future warfighting capabilities.

Joint Requirements Oversight Council (JROC). The JROC, introduced in Chapter 5, has the lead for oversight of the JCIDS and validates and approves JCIDS documents for ACAT I and ACAT IA programs. The JROC is chaired by the Vice Chairman of the Joint Chiefs of Staff. Members include the vice chiefs of staff of the Army and Air Force, the Vice Chief of Naval Operations, and the Assistant Commandant of the Marine Corps.

Joint Capabilities Board (JCB). The JCB functions to assist the JROC in carrying out its duties and responsibilities. The JCB reviews and, if appropriate, endorses all JCIDS and joint doctrine, organization, training, materiel, leadership and education, personnel, and facilities change recommendation documents prior to their submission to the JROC. The JCB is chaired by the Joint Staff Director of Force Structure, Resources, and Assessment (J-8). It is composed of general and flag officer representatives of the military services.

Four JCIDS documents are used in DoD to support the acquisition process. The initial capabilities document (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 materiel development decision and Milestone A, and to guide the materiel solution analysis and the technology development phases of the acquisition process.

A Joint DOTMLPF Change Recommendation (DCR) may request additional numbers of existing commercial or non-developmental items previously produced or deployed in addition to non-materiel changes to resolve gaps in warfighting capabilities

During the technology development phase, a capability development document (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 engineering and manufacturing development phase of the acquisition process.

During the engineering and manufacturing development phase, the capability production document (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 engineering and manufacturing development phase.

Key Performance Parameters. Key Performance Parameters (KPPs) are those attributes or performance characteristics considered most essential for an effective military capability. The CDD and the CPD both contain KPPs that are included in the acquisition program baseline (APB), which is described in Chapter 7. Either the JROC or the DoD component validates the KPPs, depending on the joint potential designator (JPB) of the program—discussed later.

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.

IDENTIFYING NEEDED CAPABILITIES

The capabilities-based assessment (CBA) process is the backbone of JCIDS (see Figure 6-2). The CBA identifies the capabilities required to

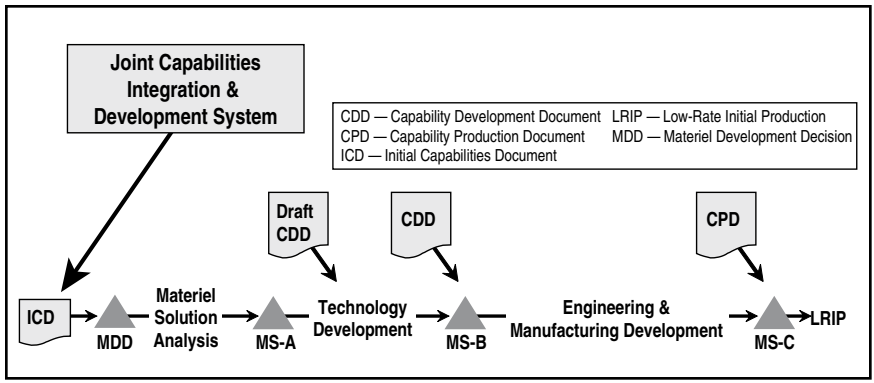

Figure 6-1. JCIDS Process & Acquisition Decisions

successfully execute missions, the shortfalls in existing weapon systems to deliver those capabilities and the associated operational risks, and the possible non-materiel approaches for mitigating or eliminating the shortfall. When appropriate, the CBA recommends pursuing a materiel solution.

CBA is a top-down approach starting with strategic guidance from the President; the Secretary of Defense; and the Chairman, Joint Chiefs of Staff. The President's *national security strategy* provides the Secretary of Defense guidance for the *national defense strategy*, which in turn provides

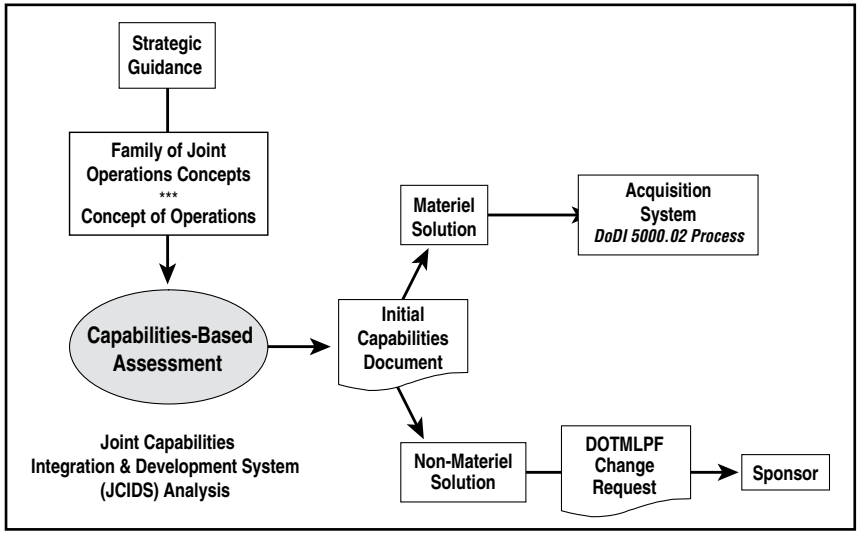

Figure 6-2. Capabilities-Based Assessment Process

the Chairman guidance upon which to base the *national military strategy*. The *national military strategy* 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*.

Based on this top-level strategic guidance, the Joint Staff prepares supporting documents to refine the guidance into more detailed concepts and architectures that sponsors can use as a basis for the JCIDS analysis. The *Family of Joint Operations Concepts* describes how the joint force intends to operate 15 to 20 years from now. A *concept of operations* is a verbal or graphic statement, in broad outline, of a commander's assumptions or intent for an operation or series of operations. Also called a "commander's concept," it is included primarily for additional clarity of purpose.

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." Typical sponsors of JCIDS analysis are 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 Marine Corps 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.

Joint Potential Designators

A proposed capability document will be assigned a Joint Potential Designator (JPD) based on its potential Acquisition Category (ACAT) and its potential for affecting joint force operations. The JPD also determines the level of joint staff review and certification. For descriptions of JPDs currently in use, see the JCIDS Manual mentioned earlier.

Functional Capability Boards

The JROC charters FCBs are responsible for the organization, analysis, and prioritization of joint warfighting capabilities within an assigned functional area. As of the date of this booklet, the JROC had chartered FCBs for command and control, battlespace awareness, logistics, force support, protec-

tion, force application, net-centricity, building partnerships, and corporate support and management. In addition to the review and validation of JCIDS documents, FCBs are responsible for all aspects, materiel and nonmateriel, of their assigned functional area.

Gatekeeper

The Gatekeeper performs an initial review of all JCIDS proposals and determines the Joint Potential Designator and the lead and supporting FCBs. Formal staffing of JCIDS documents begins after Gatekeeper decisions. The Joint Staff Vice Director, J-8, serves as the Gatekeeper. The Gatekeeper is supported by the FCB working group leads and the Joint Staff, J-6.

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

- 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.

As shown in Figure 6-3, C4I interoperability issues affect all kinds of systems. When applied to communications-electronics systems or items, interoperability means information can be exchanged directly and satisfactorily between systems and items of equipment.

C4I interoperability policy affects both kinds of information technology systems: automated information systems (i.e., systems that normally satisfy business and/or administrative requirements, like the information systems used in the Defense Commissary System); and command, control, communications, computer, and intelligence systems used to assist the commander in organizing, directing, and controlling warfighting forces.

Achievement of seamless interoperability between all defense command, control, communications, computer, and intelligence systems is of the highest priority. To this end, DoD has developed a series of architecture framework documents that provide guidance for the development of architectures to evolve the Department's transformation to a new type of information-intensive warfare known as net-centric warfare (NCW). NCW focuses on generating combat power from the networking

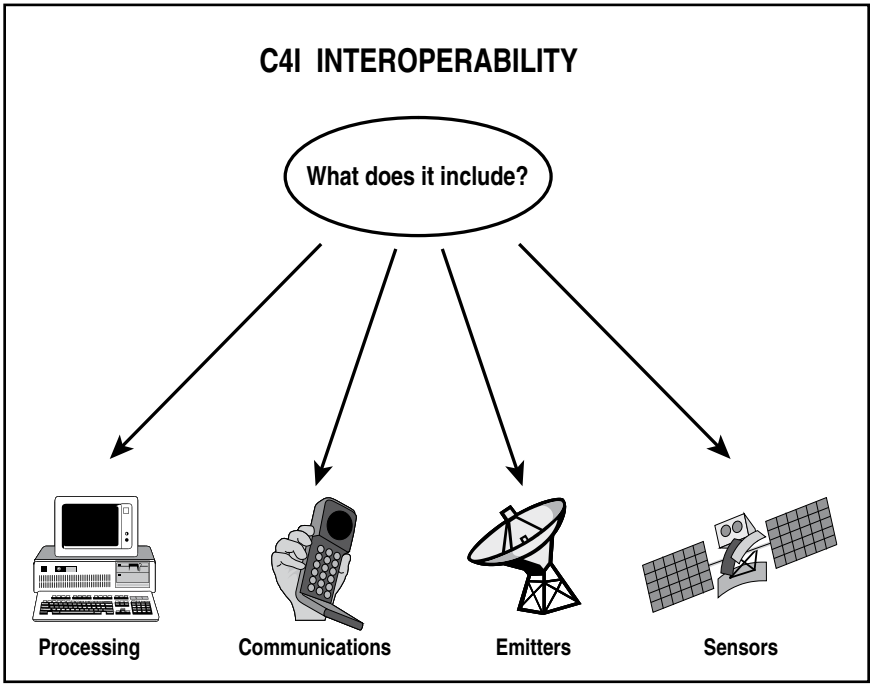

Figure 6-3. Command, Control, Communications, Computers, and Intelligence Interoperability

of warfighting organizations, making essential information available to authorized users when and where they need it. The current DoD Architecture Framework is available from the Web site of the Assistant Secretary of Defense for Networks and Information Integration (see Internet Resources after last chapter).

TESTING OF C4I INTEROPERABILITY REQUIREMENTS

All C4I systems having joint interoperability requirements, regardless of ACAT, and must be tested and certified by the Joint Interoperability Test Command. This testing should be performed during developmental operational testing whenever possible to conserve resources.

7

DEFENSE ACQUISITION MANAGEMENT SYSTEM

ACQUISITION LIFE CYCLE

The acquisition management system for defense systems is commonly referred to as the acquisition life cycle. The generic model for this process is illustrated in Figure 7-1. PMs may tailor this model using discretion and prudent business judgment to structure an innovative and responsive program.

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 PM and milestone decision authorities (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 acquisi-

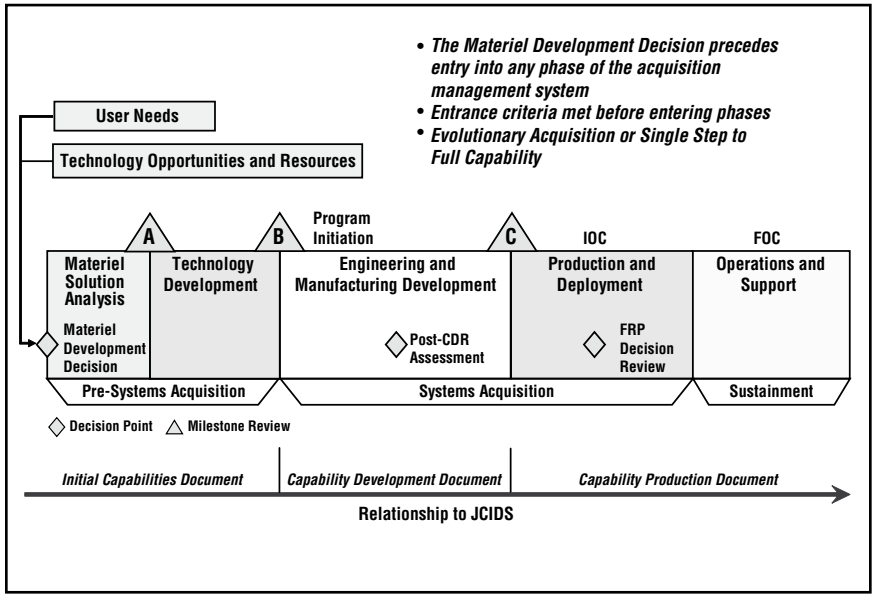

Figure 7-1. Defense Acquisition Management System

tion process by signing an acquisition decision memorandum upon completion of a successful decision review.

The life cycle process takes the program through determination of mission needs; 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 Chairman of the Joint Chiefs of Staff, with the assistance of the Joint Requirements Oversight Council (JROC), assesses and provides advice regarding military capability needs for defense acquisition programs. User needs are determined by the Joint Capabilities Integration and Development System (JCIDS) discussed in Chapter 6.

The Defense Science and Technology Program identifies and explores technological opportunities within 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. There is a broad range of mechanisms to facilitate the transition of innovative concepts and superior technology to the acquisition process, among them Joint Experimentation, Defense Advanced Research Projects Agency projects, the Technology Transition Incentive Program, Small Business Technology Transfer Programs, the Joint Integration and Interoperability Program, Joint Capability Technology Demonstrations, the Coalition Warfare Program, the Quick Reaction Special Projects/ Rapid Reaction Fund, Foreign Comparative Testing, and the Defense Acquisition Challenge Program.

Entrance and Exit Criteria

Before any acquisition program can enter into a phase of the life cycle, it must satisfy generic entrance criteria specified by DoDI 5000.02 (for example, completion of selected studies, reports, and demonstrations in certain operational environments). Before a program can exit a phase of the life cycle, it must demonstrate it has met any of the general criteria ap-

plicable to all programs specified by DoDI 5000.2 and any phase-specific exit criteria applicable to that specific program—such as demonstrating that certain technological risks have been overcome.

Evolutionary Acquisition

Evolutionary acquisition is the preferred DoD strategy for rapid acquisition of mature technology for the user. In an evolutionary approach, a needed operational capability is met over time by delivering capability in several increments, recognizing up front the need for future capability improvements. The objective is to rapidly field the first increment and put the capability into the hands of the user quickly. Evolutionary acquisition requires collaboration among the user, tester, and developer.

Milestones and Phases

Following is a brief discussion of each of the phases, milestones, and other decision reviews. There is no single design; 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 PM, based on an objective assessment of the program's technical maturity and risks.

Milestone decisions are made by the appropriate MDA depending on the acquisition category (ACAT) of the program (see Chapter 5). Prior to each decision point, the appropriate JCIDS document must be approved (see Chapter 6).

ACQUISITION STRATEGY CONSIDERATIONS

Pre-Systems Acquisition

Pre-systems acquisition is composed of activities in development of user needs, science and technology, and 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: materiel solution analysis and technology development.

Materiel Development Decision (MDD). The MDD is the formal entry into the acquisition process and is required for all programs. At the MDD,

the Joint Staff presents the JROCs recommendations, and the sponsoring Component presents the ICD. The MDA will decide the acquisition phase of entry and designate the lead DoD component. The MDA also provides the Analysis of Alternatives (AoA) study guidance approved by the Director, Cost Assessment and Program Evaluation to the lead Component.

Materiel Solution Analysis Phase. During this phase a study called an *analysis of alternatives* is conducted to assess alternatives to provide the desired capability identified in the ICD. To achieve the best possible system solution, *materiel solution analysis* places emphasis on innovation and competition and on existing commercial off-the-shelf and other solutions drawn from a diverse range of large and small businesses. An analysis of alternatives and a technology development strategy are developed to help guide the efforts during the next phase, which is technology development. Materiel solution analysis ends when materiel solution to the capability need identified in the ICD is recommended by the lead component.

Milestone A. At Milestone A, the MDA approves a materiel solution, the technology development strategy, and, for major defense acquisition programs, must certify that the program fulfills an approved ICD, is being executed by an entity with a relevant core competency, a cost estimate has been submitted, and the resources required to develop and procure the system are consistent with the priority level assigned by the JROC.

Technology Development Phase begins after a Milestone A decision by the MDA. The ICD and Technology Development Strategy 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, determine the appropriate set of technologies to be integrated into a full system, and complete a preliminary design. Competitive prototyping is used to reduce technical risk, validate designs and cost estimates, evaluate manufacturing processes, and refine requirements.

The project exits technology development when an affordable program or increment of militarily useful capability has been identified, the technology has been demonstrated in a relevant environment, manufacturing risks

have been identified and assessed, a preliminary design review[9] has been conducted for the solution, and a system or increment can be developed for production within a short timeframe (normally less than 5 years for weapon systems); or when the MDA decides to terminate the effort.

Systems Acquisition

Milestone B. Milestone B will normally be program initiation for defense acquisition programs.[10] 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 (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, the type of contract for the next phase, and authorizes entry into the engineering and manufacturing development phase.

The MDA also certifies to the congressional defense committees that the program is affordable, funding is available, market research was conducted, an analysis of alternatives was completed, the JROC is in agreement, technology has been demonstrated in a relevant environment, a preliminary design review has been conducted, and the program has a high likelihood of accomplishing its intended mission and complies with all statutory and regulatory requirements.

Engineering and Manufacturing Development Phase: The purpose of the EMD phase is to develop a system or an increment of capability; complete full-system integration; develop an affordable and executable manufacturing process; ensure operational supportability with particular attention to minimizing the logistics footprint; implement human systems integration (HSI); design for producibility; ensure affordability; protect critical program information by implementing appropriate techniques such as anti-tamper; and demonstrate system integration, interoperability, safety, and utility.

[9] In some cases a preliminary design review may be conducted after Milestone B. In those cases, the MDA will conduct a Post-Preliminary Design Review Assessment

[10] The Milestone Decision Authority may initiate shipbuilding programs at Milestone A.

Entrance criteria for this phase are technology maturity, full funding in the Future Years Defense Program (discussed in Chapter 8), and an approved capability development document (CDD). 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, including passing of data). The efforts of this phase are guided by the acquisition strategy, the systems engineering plan, the test and evaluation master plan, and the CDD.

The key performance parameters (KPPs) (see Chapter 6) will guide the technical activities of this phase. KPPs are found in both the approved CDD 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, *integrated systems design and system capability* and *manufacturing process demonstration*. *A post-critical design review (CDR) assessment* by the MDA takes place to authorize entry into system capability and manufacturing process demonstration.

Integrated System Design: During this effort, system and system-of-systems functionality and interfaces are defined; hardware and software detailed design are completed; and system-level risk is reduced. Integrated system design includes the establishment of the product baseline.

Post-Critical Design Review Assessment: The MDA conducts a formal program assessment following system-level CDR. The system-level CDR provides an opportunity to assess design maturity, as evidenced by measures such as the percentage of hardware and software product build to specifications and drawings completed and under configuration management; planned corrective actions to hardware/software deficiencies; adequate developmental testing; manufacturing feasibility and critical manufacturing processes; an estimate of system reliability based on demonstrated reliability rates; etc.

System Capability and Manufacturing Process Demonstration: This effort is intended to demonstrate the ability of the system to operate in a useful way consistent with the approved KPPs, and that system production can be supported by demonstrated manufacturing processes. The program enters system capability and manufacturing process demonstration upon completion of the post-CDR assessment. Critical during this effort are developmental test and evaluation to assess technical progress against critical

technical parameters, early operational assessments, and—where proven capabilities exist—the use of modeling and simulation to demonstrate system/system of systems integration.

This effort ends when the system meets approved requirements and is demonstrated in its intended environment using the selected production-representative article; manufacturing processes have been effectively demonstrated; industrial capabilities are reasonably available; and the system meets or exceeds exit criteria and Milestone C entrance requirements.

Milestone C: The MDA makes the decision to commit the Department of Defense 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. Milestone C authorizes limited deployment in support of operational testing for major automated information systems (MAIS) or software-intensive systems with no production components. 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 developmental 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); 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 com-

pletion 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 feasible 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 PM must ensure 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. The operations and support phase begins as soon as the first systems are fielded/deployed; therefore, the production and deployment phase overlaps the next phase, operations and support.

Operations 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 operations and support phase includes life cycle sustainment and disposal.

Life Cycle Sustainment seamlessly spans a system's entire life cycle, from materiel solution analysis to disposal. It translates force-provider capability and performance requirements into tailored product support to achieve specified and evolving life cycle product support availability, reliability, and affordability parameters. Life cycle sustainment planning starts

during materiel solution analysis, and matures throughout technology development.

Life cycle sustainment considerations include supply; maintenance; transportation; sustaining engineering; data management; configuration management; human systems integration; environment, safety (including explosives safety), and occupational health; protection of critical program information and anti-tamper provisions; supportability; and interoperability. The PM employs performance-based life cycle (PBL) product support planning, development, implementation, and management. PBL offers the best strategic approach for delivering required life cycle readiness, reliability, and ownership costs. Sources of support may be organic, commercial, or a combination, with the primary focus on optimizing customer support, weapon system availability, and reduced ownership costs.

Disposal of the system occurs at the end of its useful life. The PM should have planned for disposal early in the system's life cycle and should ensure that the system disposal minimizes DoD's liability resulting from environmental, safety, security, and health issues. Environmental considerations are particularly critical during disposal, as there may be international treaty or other legal considerations that require intensive management of the system's demilitarization and disposal.

KEY ACTIVITIES

All acquisition programs must accomplish certain key activities to ensure success. These activities provide information that helps the PM balance cost, schedule, and performance considerations to meet the warfighter's needs on time and at an affordable cost. Cost includes all funds required to design, develop, produce, operate, support, and dispose of the 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.

The key activities listed here are not all-inclusive; however, they highlight the business and technical activities that apply to all acquisition programs. For additional information on these and numerous other activities that support the acquisition process, see the *Defense Acquisition Guidebook* at <http://acc.dau.mil/dag>.

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 during the materiel solution analysis phase using an analysis of alternatives study. For an ACAT I program, this process can be quite formal, requiring significant time, effort, and money.

Cost Estimating: Life cycle cost estimating must be accomplished to support inputs into the program objectives memorandum (see Chapter 8) and the budget. Depending on the ACAT of the program, cost estimating is done at the program level (called the *program office estimate*); the component headquarters level (called a *component cost estimate*); and at the defense staff level (called an *independent cost estimate*) (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 its other commitments.

Preparation of an Acquisition Strategy and Program Structure: The acquisition strategy, developed by the PM and approved by the MDA at Milestone B, 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 it 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—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); and performing contractor surveillance and monitoring performance.

Budget Execution: Resources must be budgeted and obtained to execute contracts with industry. The process includes formulating input for the *program objectives memorandum* (a spend plan covering a 6-year period), the budget, and other programmatic or financial documentation in support of the planning, programming, budgeting, and execution 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 PM 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 the Under Secretary of Defense for Acquisition, Technology and Logistics.

Test Planning: Test planning is central to the formulation of a coherent acquisition strategy. A variety of testing must be planned and accomplished either to confirm program progress or to conform to statutory dictate. After all, it is by testing that we validate the performance requirements identified by the user in the capability production document and promised in the acquisition program baseline by the PM. Testing includes developmental test and evaluation, operational test and evaluation, and live-fire test and evaluation, as appropriate. The PM will coordinate all testing into an efficient continuum, closely integrated with requirements definition and systems design and development. The PM's test and evaluation master

plan 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, communication, control, computer, and intelligence systems. The ISP includes system description, employment concept, operational support requirements, and interoperability and connectivity requirements.

Formulation of Exit Criteria: MDAs use exit criteria to establish goals for an acquisition program during a particular phase. At each milestone review, the PM 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" that, 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.

Systems Engineering: The DoD acquisition process is critically dependent on effective and rigorous engineering processes—without them, operationally affordable and sustainable weapon systems cannot be built. Overarching all engineering efforts is a technical discipline called systems engineering. Systems engineering is applied at the initial stages of program formulation, and it continues throughout a system's life cycle. It transforms needed operational capabilities into an integrated system design through concurrent consideration of all life cycle needs; integrates the technical efforts related to system and software development, manufacturing, verification, deployment, operations and support, disposal and user training for systems and their life cycle supporting products and services; and develops credible and timely technical information to support the program management decision-making process.

Technology Maturity: The management and mitigation of technology and technology integration risk, which allows less costly and less time-consuming systems development, is a crucial part of overall program management and is especially relevant to meeting cost and schedule goals. Objective assessment of technology maturity and risk is a routine aspect of DoD acquisition. Technology developed in science and technology or procured from industry or other sources must be demonstrated in a relevant environment—preferably an operational environment—to be considered mature enough to use for product development.

Program Protection Planning: A program protection plan must be prepared for any program that is determined by the PM 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

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 PMs are equally concerned with providing information to ensure their programs are funded for the future and with the day-to-day management of their program. Following is a brief discussion of these four phases, which are depicted in Figure 8-1 on the next page.

PHASE I—PLANNING, PROGRAMMING, BUDGETING, AND EXECUTION PROCESS

The Planning, Programming, Budgeting and Execution (PPBE) process is unique to DoD. The other executive agencies use internal annual processes to determine required resources. The PPBE process produces the DOD portion of the President's national budget. PPBE process is one of three decision support systems that control the DOD acquisition process. The Joint Capabilities Integration and Development System (JCIDS) (see chapter 6) and the Defense Acquisition System (see chapter 7) are the other two.

PPBE is a annual cycle that produces the Defense Planning and Programming Guidance (DPPG), and a Program Objectives Memorandum

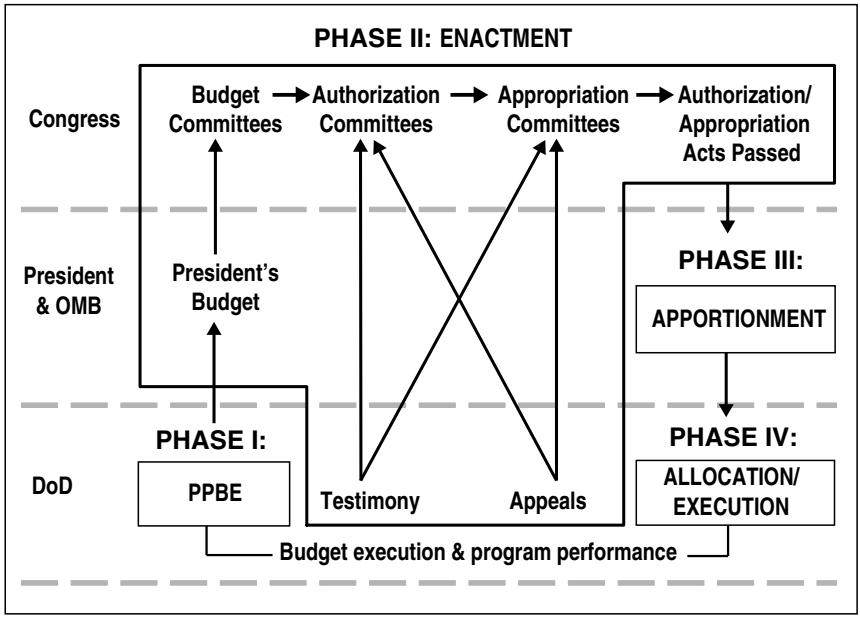

Figure 8-1. Resource Allocation Process

(POM) and Budget Estimate Submission (BES) for each military department, defense agency and selected other agencies/offices, and finally the DOD portion of the President's annual budget submission to Congress. Updates to the Future Years Defense Program (FYDP) occur when the POM/BES are submitted and when the President's Budget is sent to Congress. The FYDP is a data base that contains all approved DOD programs with the associated 5-year funding stream.

The Deputy Secretary of Defense (DEPSECDEF) manages PPBE and makes recommendations for decisions to the Secretary of Defense (SECDEF). The Deputy's Advisory Working Group (DAWG), co-chaired by the DEPSECDEF and the Chairman of the Joint Chiefs of Staff (CJCS), is the panel that provides oversight of PPBE activities.

There are a series of national strategy documents that underpin the planning phase of PPBE. These include the President's National Security Strategy (NSS), the SECDEF's National Defense Strategy (NDS), and the CJCS' National Military Strategy (NMS). The NSS and NDS provide the strategic framework for a congressionally directed Quadrennial Defense Review (QDR) that takes place every four years during the first year of a new presidential administration. The QDR report is provided to congress

concurrent with the President's Budget in the 2nd year of a new administration. The PPBE process includes planning, programmatic and budgetary actions to implement the military force structure and defense priorities outlined in the QDR report. The QDR occurs every four years. The NSS and NDS may be updated annually. The NMS is updated by the CJCS as necessary.

Planning. Planning (see figure 8-2) involves planners in the Joint Staff, Office of the Secretary of Defense, and the Military Departments. Considering guidance from the latest QDR, NSS, NDS, NMS, and intelligence estimates, planners look at threats facing the nation for next 6–20 years, assess capabilities to counter them, and recommend forces to defeat them. The White House issues provisional budget levels (fiscal guidance), normally just after the President's budget is submitted to Congress in February. This fiscal guidance impacts content of the emerging DPPG and subsequent POM and BES submissions.

Front End Assessments (FEAs) may be conducted to address major issues identified by the SECDEF. Results of the FEAs drive programming and budgeting actions by the military departments and defense agencies. FEAs were first conducted during the FY 2012–016 program budget development. Eight issues were considered: Strategic Communication

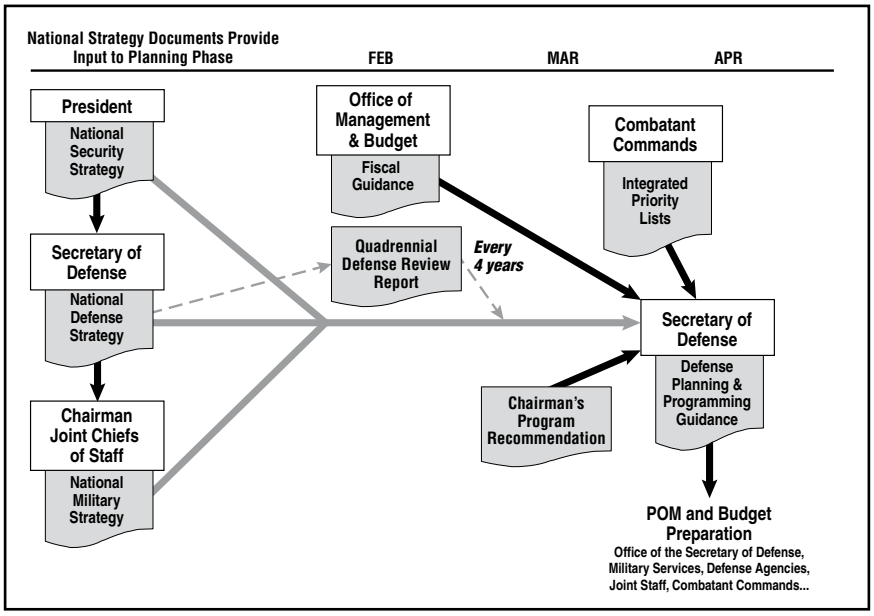

Figure 8-2. PPBE Planning Phase

and Information Operations; Long Range Family of Systems; Airborne Intelligence, Surveillance, and Reconnaissance; Cyber Defense; Global Posture; Reset Of Equipment From Operations; Integrated Air and Missile Defense; and Tactical Aircraft.

In support of Military Service POM development, the Combatant Commands[11] prepare an Integrated Priority List (IPL), which is a succinct statement of key capability gaps that could hinder the performance of assigned missions. This list is prioritized across Service and functional lines and is fiscally constrained. The IPL is submitted to the SECDEF, DEPSECDEF, and the CJCS.

The CJCS issues a Chairman's Program Recommendation (CPR) in early March. The CPR reflects the warfighting requirements of the unified commands and CJCS priorities for consideration in the DPPG. The final DPPG, issued in the spring, records decisions made during the planning process.

Programming. Programming and budgeting processes run concurrently and formally start when the DPPG is issued (see figure 8-3). However, in reality the departments and agencies start their POM/BES development much earlier. Programming is the process that matches available dollars against a prioritized list of requirements to develop a five-year resource proposal called a POM. The military services, defense agencies, selected combatant commands and major staff sections within OSD prepare a POM based on guidance in the DPPG. POM's are submitted on/about the end of July to the OSD Director, Cost Assessment and Program Analysis (CAPE). Generally, the OSD integrated program budget review runs from August through November.

The CJCS' Chairman's Program Assessment (CPA) is the Chairman's personal assessment of the POM's conformance to the priorities established in strategic plans and Combatant Command requirements. It also provides the Chairman an opportunity to submit alternative program recommendations and budget proposals.

The OSD and Joint Staff prepare issue papers on their concerns with department/ agency POM's. These issue papers are reviewed by a panel of

[11] Combatant Commands are the unified commands that fight the nation's wars. They include six regional commands (European, Pacific, Northern, Southern, Central and Africa commands), and four supporting functional commands (Special Operations, Transportation, Strategic, and Joint Forces commands).

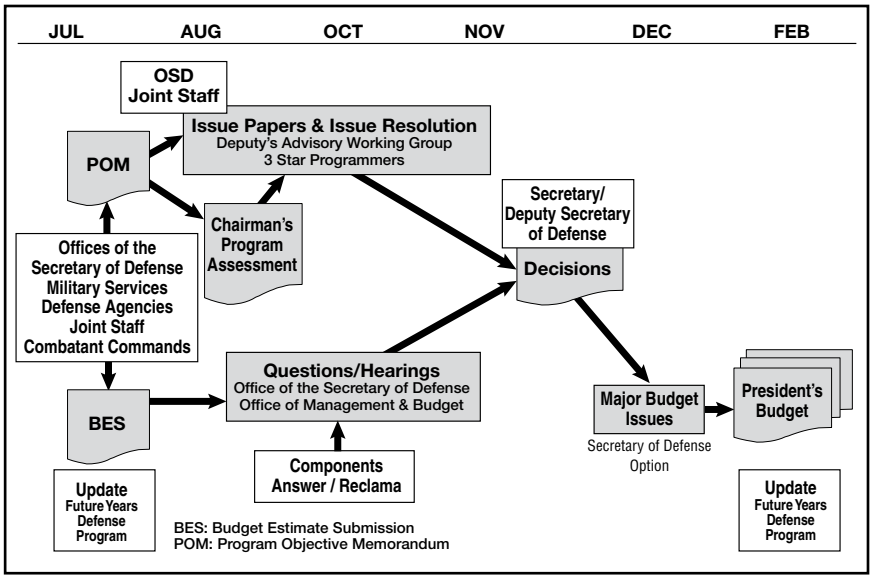

Figure 8-3. PPBE Annual Program/Budget Review

3-Star Programmers chaired by the OSD Director, CAPE. The 3-Star review identifies major issues and develops decision options for presentation to the DAWG. The DAWG assists the SECDEF in making major program decisions, which are reflected in a Resource Management Decision (RMD) or a series of RMDs signed by the SECDEF. The DAWG review is usually completed and decisions are issued by November in time to influence additional RMD's coming out of the budgeting process.[12]

Budgeting: Budgeting activities run concurrently with POM development and review activities (see figure 8-2 on previous page). A budget estimate is prepared for the first year of the POM. This is called the "Budget Estimate Submission (BES)." The BES is submitted to the Under Secretary of Defense (Comptroller) at the same time the POM is submitted to Director, CAPE. Activities during the budgeting phase price all programs and translate the first POM year into the DOD portion of the President's Budget.

A Budget review is conducted by the Under Secretary of Defense (Comptroller), with OMB participation, to review department/agency estimates of program costs. This budget "scrub" looks at two principal issue

[12]"Resource Management Decisions (RMDs)" replaced Program Decision Memoranda (PDM) and Program Budget Decisions (PBDs) during the FY 2011–2015 cycle.

areas: 1) Program Pricing (budget to most likely cost), and 2) Program Executability (program phasing, program funding profile, obligation rates and outlay rates). Final decisions are recorded through a series of RMD's.

The DoD budget, as adjusted by RMDs, goes to OMB to be incorporated into the President's Budget. At the option of the SECDEF, each DoD Component head may have one final opportunity to address major budget Issues with the SECDEF prior to the final DoD budget submission to OMB. The FYDP is again updated to reflect the final President's Budget and becomes the baseline for the next cycle. This ends the budgeting activities of PPBE.

Execution. PPBE activities at OSD end with the development of the DOD portion of the President's Budget. Execution refers to an implementation review of previous program budget decisions and runs currently with the annual PPBE activities at OSD.

President's Budget: The Budget Enforcement Act provides a one-month window from the first Monday in January to the first Monday in February for the President to submit the budget to Congress. Most Presidents wait until the last day.

PHASE II—ENACTMENT

Enactment is the process through which 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 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 to DoD and other federal agencies. Apportionment occurs when the Office of Management and Budget provides those funds to DoD and other federal agencies. Subsequently, DoD allocates funds within the Department through action by the Under Secretary of Defense (Comptroller) and his counterpart 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 8-4).

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

It is incumbent upon PMs 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 in the process at all times. Note that 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 PMs. This may be the most challenging part of a PM's job and, if not managed carefully, can become the greatest single source of program instability.

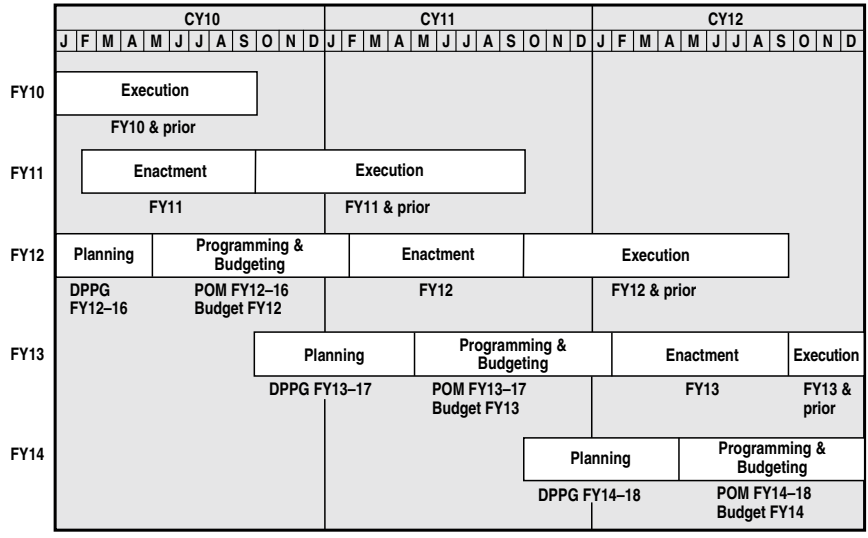

Figure 8-4. Resource Allocation Process – Overlap

INTERNET RESOURCES

For readers who wish to follow-up with additional study on the defense acquisition system, we present the following list of Web sites for the major organizations and documents mentioned in this pamphlet. Web addresses are current as of the publication date of this pamphlet.

Organization/Document	WWW Location
Acquisition Community Connection	https://acc.dau.mil (requires registration)
Assistant Secretary of the Army (Acquisition, Logistics and Technology), the Army Acquisition Executive	https://www.alt.army.mil/portal/page/portal/oasaalt
Assistant Secretary of the Air Force (Acquisition), the Air Force Acquisition Executive	http://ww3.safaq.hq.af.mil
Assistant Secretary of the Navy (Research, Development and Acquisition), the Navy and Marine Corps Acquisition Executive	http://acquisition.navy.mil
Assistant Secretary of Defense (NII), the DoD Chief Information Officer	www.dod.mil/nii
Joint Capability Technology Demonstrations	www.acq.osd.mil/actd
Chairman, Joint Chiefs of Staff	www.jcs.mil
CJCSI 3170 series and JCIDS Manual	https://acc.dau.mil/CommunityBrowser.aspx?id=267116
Defense Acquisition Guidebook	http://acc.dau.mil/dag
Defense Acquisition Portal	https://dap.dau.mil
Defense Acquisition University	www.dau.mil
Defense Acquisition University Continuous Learning Center	http://clc.dau.mil
Director, Operational Test and Evaluation	www.dote.osd.mil
DoDD 5000.01 and DoDI 5000.02	www.dtic.mil/whs/directives
Future Joint Warfare (Family of Joint Operations Concepts)	www.dtic.mil/futurejointwarfare
Federal Acquisition Regulation (FAR)	http://www.acq.osd.mil/dpap/dars/index.html

Organization/Document	WWW Location
Defense FAR Supplement (DFARS)	http://www.acq.osd.mil/dpap/dars/index.html
Office of the Secretary of Defense	www.defenselink.mil
Under Secretary of Defense for Acquisition, Technology and Logistics	www.acq.osd.mil

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