INTRODUCTION TO DEFENSE ACQUISITION MANAGEMENT

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EIGHTH EDITION


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PREFACE

This eighth edition of *Introduction to Defense Acquisition Management* includes revisions to the regulatory framework for Defense systems acquisition management from the November 2008 Department of Defense Instruction 5000.02, and includes policy for determining requirements for Defense Systems from the Chairman of the Joint Chiefs of Staff 3170 series, Joint Capabilities Integration and Development System.

This pamphlet 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 pamphlet is based on numerous source documents. For the reader who wishes to dig deeper into this complex area, a list of World Wide 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.
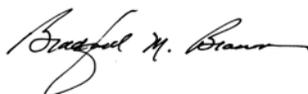
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ACKNOWLEDGMENTS

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1

BASICS

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

> *The Defense Acquisition System exists to manage the nation's investments in technologies, programs, and product support necessary to achieve the National Security Strategy and support the United States Armed Forces. The investment strategy of the Department of Defense shall be postured to support not only today's force, but also the next force, and future forces beyond that. The primary objective of Defense acquisition is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price. (DoD Directive 5000.01)*

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 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.

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[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 & execute national security policy • Patriotism • Personal ambition • Reelection	• Sign legislation into law (President) • Commander-in-Chief (President) • Negotiate with Congress • Make decisions on major defense acquisition programs (the Under Secretary of Defense 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 • Reelection	• Conduct hearings • Raise revenue; allocate funds • Pass legislation • 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.
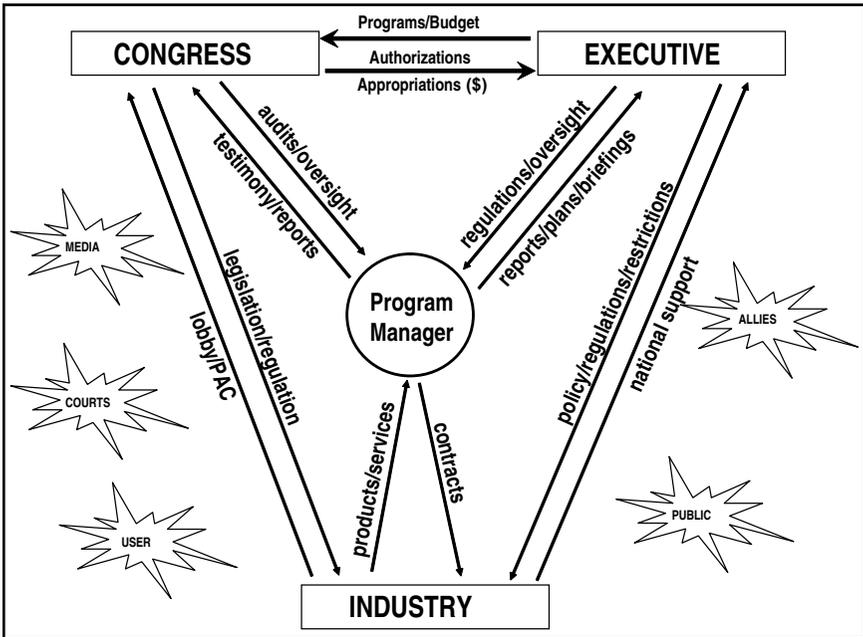
Figure 1-1. The Program Manager's Environment

Successful Defense Acquisition Program

A successful defense acquisition program places a capable and support-able system in the hands of a user (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*

- *Annual authorization and appropriations legislation*, which may contain substantial new or amended statutory requirements (like the FY 2006 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*, (2008, 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

Transformation of the Department of Defense

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.

> In the varied and highly uncertain future security environment that we expect, potential adversaries will increasingly benefit from technology diffusion and access to advanced weapon systems. Complex and adaptive adversaries will likely employ—singly or in combinations—traditional, irregular, disruptive, and catastrophic methods intended to keep the future joint force from being successful across the range of military operations.[2]

To help prepare for an uncertain and dangerous future, the 2003 *Transformation Planning Guidance* provided a strategy for transforming "how we fight, how we do business, and how we work with others." The *2006 Quadrennial Defense Review* (*QDR*) provided new direction for accelerating the transformation of the Department to focus on the needs of the combatant commanders[3] and to develop portfolios of joint capabilities rather than stovepiped acquisition programs. The 2008 *National Defense Strategy* stresses the importance of winning the Long War.

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[2] *Capstone Concept for Joint Operations, Version 2.0*, Joint Experimentation Transformation and Concepts Division, August 2005. Available at **<www.dtic.mil/jointfuturewarfare>**.

[3] *Combatant commanders* are the commanders of the United Commands responsible for fighting the nation's wars.

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.[4]

Transforming How We Fight. Transforming how we fight hinges on the development of future joint warfighting concepts and includes the full range of military capability areas: doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF). Chapter 6, Joint Capabilities Integration and Development System, addresses the process for assessment of DOTMLPF gaps in warfighting capability, and the relationship to the acquisition of defense systems for the *materiel* capability area.

Transforming How We Do Business. A priority for the Department is the transformation of the acquisition process. The latest acquisition policies and procedures, summarized in chapters 4 and 6, provide insight on the implementation of evolutionary acquisition to reduce cycle time and field an initial increment of warfighting capability as fast as possible.

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

<p align="center">Transforming Defense Acquisition</p>

Perhaps the most notable changes in defense systems acquisition were caused by the collapse of the Soviet Union, and the terrorist attack on the World Trade Center and the Pentagon on September 11, 2001. These major world events impacted national objectives, treaties, budgets, and alliances. The specter of strategic thermonuclear war lessened while the probability of regional conflicts and policing actions increased. Domestic terrorism, information warfare, and narcotics control are becoming increasingly troublesome threats to national security, and the Department is playing an ever-increasing role in confronting these issues.

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

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

During 2005 and 2006, a series of studies were conducted resulting in a number of recommendations for transforming the defense acquisition process. Congress considered the results of these studies to be important enough to require periodic reports to Congress on the status of the recommendations. The studies were as follows:

- *The Defense Acquisition Performance Assessment Panel* (*DAPA*) *Report*, January 2006;

- The Defense Science Board 2005 Summary Study: *Transformation: A Progress Assessment, Volume 1*, February 2006;

- The Center for Strategic and International Studies Phase 2 Report, *Beyond Goldwater-Nichols: U.S. Government and Defense Reform for a New Strategic Era*, July 2005;

- *The Quadrennial Defense Review Report*, February 6, 2006.

These studies contained numerous major recommendations for improving defense systems acquisition. A few of the major initiatives related to these recommendations are highlighted here.

Transformation Initiatives

Improve and Empower the Acquisition Neighborhood. The Department developed rapid acquisition training capabilities for high-priority initiatives such as the Requirements Training and Certification Program, Rapid Acquisition, Continuous Process Improvement–Lean Six Sigma (LSS), and other initiatives. In response to a gap assessment, an international career path and training program was developed for personnel supporting international programs. In 2007, the Department implemented a robust

AT&L webcast capability and has deployed learning sessions led by senior leaders addressing priority initiatives. The USD(AT&L) deployed a new learning asset—the Living Library at the Defense Acquisition University—to share expert knowledge and unique lessons learned on key acquisition practices such as the Configuration Steering Board, competition and prototyping, and other best practices. Success of this initiative is defined as government representatives who act in an unbiased manner in evaluating all courses of action and who constantly attack regulations and bureaucratic impediments to more effectively and efficiently deliver value for the warfighter.

Configuration Steering Boards (CSBs). Military departments are establishing CSBs for every current and future ACAT I (see Chapter 4) program in development. The CSBs 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 require competitive, technically mature prototyping. Pending and future programs will provide for two or more competing teams to produce prototypes through Milestone B, engineering, manufacturing, development, and demonstration. 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. The Department is 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.

Capability Portfolio Management. The Department of Defense uses capability portfolio management to advise the Deputy Secretary of Defense and the heads of DoD components on how to optimize capability investments across the defense enterprise and minimize risk in meeting the Department's capability needs in support of strategy.

Systems Engineering Excellence. The Department has created a Systems and Software Engineering Center of Excellence and published policy guidance documents to assist the Defense Acquisition Workforce in the development of systems engineering plans, education, and training. This policy guidance institutionalizes best practices, applies performance incentives, and makes systems and software engineering significant factors in the acquisition process.

Technology Readiness Assessments. A central acquisition process theme is that technology should 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. This implies a need for a measure of technology maturity and for a process to ensure that only sufficiently mature technology is used. Technology Readiness Assessments are used by DoD to verify technology maturity in a rigorous fashion.

Requirements Management Certification Training. Section 801 of the John Warner National Defense Authorization Act for Fiscal Year 2007, required the USD(AT&L), 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 for Major Defense Acquisition Programs. The Joint Staff and the Defense Acquisition University developed a Requirements Management Certification Training Program for military and civilian requirements managers. The certification program is a three-tiered construct. Level I (Basic) Certification consists of the Capabilities-Based Planning Continuous Learning Module, which came online October 12, 2007. Level II (Intermediate) Certification consists of a Distance Learning Module, which came online on July 28, 2008. An additional Level III (Advanced) one-week resident course is also being considered for development.

Rapid Reaction Process. The Department's joint rapid acquisition processes are being expanded and institutionalized by the Joint Rapid

Acquisition Cell (JRAC) created in 2006. The JRAC established a community of interest among rapid acquisition stakeholders and developed an initial Joint Urgent Operational Need (JUON) application process resident on the Joint Staff Knowledge-Management/Decision-Support Tool. The JRAC established the JUON working groups, with cross-Departmental membership, to expeditiously develop solutions to validate JUONs from Combatant Commands. Specifically, the JRAC interfaces with Combatant Commanders through the Joint Staff to address unique joint warfighting needs.

Item Unique Identifier. Item unique identification (IUID) provides for marking personal property items with a machine-readable Unique Item Identifier (UII), which is a set of globally unique data elements. The UII is used in functional automated information systems to value and track DoD items through their life cycle. The Department maintains a registry of items marked with UIIs that provides accurate and accessible unique identification and pedigree information about the items. This information is used to ensure that accurate acquisition, repair, and deployment of items is efficient and effective.

Lean Six Sigma/Continuous Process Improvement. LSS has been designated as the process improvement methodology to support DoD's business transformation efforts because of its balanced approach and wide-range applicability. LSS combines the principles of Lean (reducing and eliminating non-value-added activities) with Six Sigma (reducing variation, increasing quality) to improve process efficiency and process effectiveness. Any process, whether it be manufacturing, acquisition, logistics, information technology, administration, or service can be improved by using the LSS approach. LSS can also be applied to design a process or conduct experimentation.

There are many more initiatives in place, and new ones are being tested throughout the Department. These initiatives will help America 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 may be characterized by the following chart:

Changes in Emphasis

Characteristics of Defense Systems acquisition in the past included:	Today the emphasis has shifted toward:
• Many new systems • Focus on nuclear warfare • Technology-driven systems • Service-specific programs • Military-unique technology • Technology development	• Fewer new systems; modified legacy systems • Conventional warfare • 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,

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[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.

schedule, and performance reporting to the Milestone Decision Authority. (DoDD 5000.01)

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.

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[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 primary decision support systems: the Joint Capabilities Integration and Development System (JCIDS); the Defense Acquisition System; and the Planning, Programming, Budgeting and Execution (PPBE) process (as depicted in Figure 4-1).
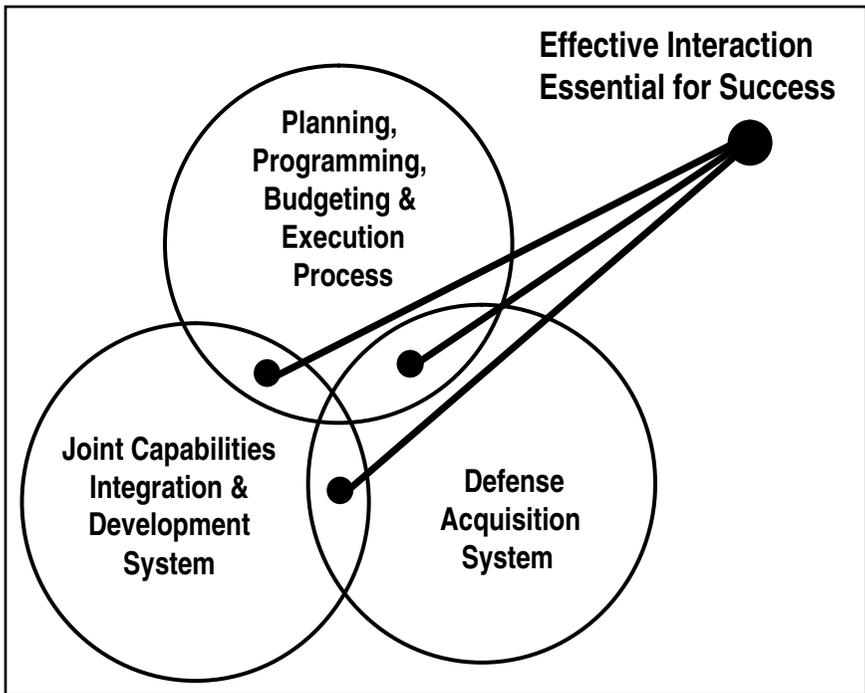
Figure 4-1. Three Major Decision-Support Systems

Three Major Decision-Support Systems

These three decision-support systems must interface on a regular basis to enable the leadership to make informed decisions regarding the best allocation of scarce resources. 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 7045.14-R, prescribes the process for making decisions on funding for every element of the Department, including acquisition programs.

Acquisition Categories

For management purposes, all defense acquisition programs fall into one of the acquisition categories (ACATs) shown in 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.

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 IAW 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)

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.

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[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
	  - Is 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 (ITAB)
		• 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)**

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

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

DoD Space Systems Acquisition Process

Management oversight of national security space systems has been delegated to the Under Secretary of the Air Force. National Security Space Acquisition Policy 03-01, December 27, 2004, 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 milestone decision authority for ACAT ID space programs, unless he/she delegates to the Air Force.

Acquisition, Technology, and Logistics Knowledge Sharing System

In addition to the regulatory documents mentioned throughout this pamphlet, the Acquisition, Technology, and Logistics Knowledge Sharing System (AKSS) can be accessed at <http://akss.dau.mil>. AKSS, 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.

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
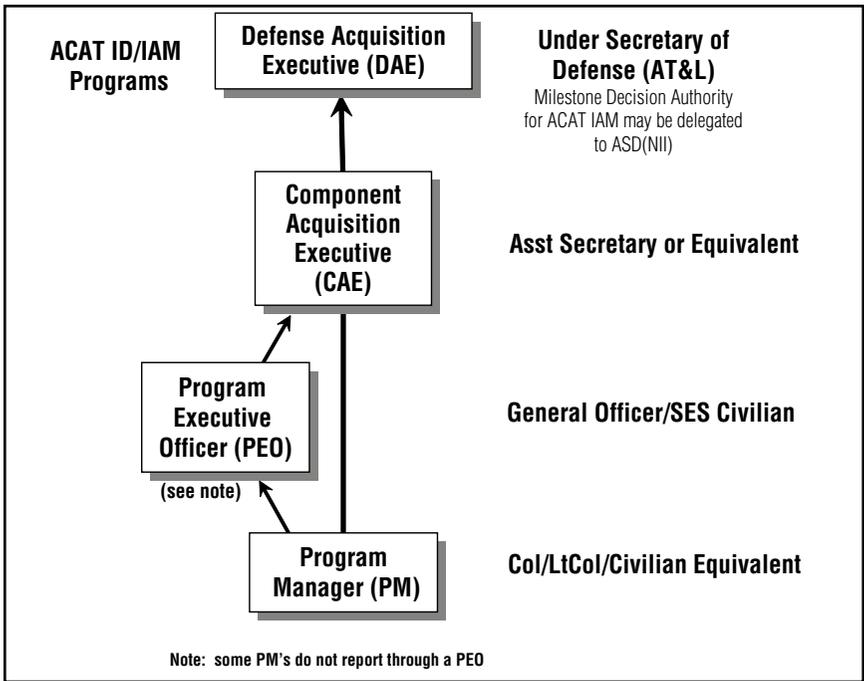
Figure 5-1. DoD Acquisition Authority Chain

his or her military department. In this capacity, the SAEs are responsible 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. Examples are the Department of the Army's PM for Future Combat Systems (Brigade Combat Team) and 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.

- *Deputy Under Secretary for Acquisition & Technology (DUSD[A&T])*: Oversees acquisition and contracting policy, and provides oversight for major defense acquisition programs. The DUSD(A&T) supervises the following:

    - Deputy Under Secretary for Industrial Policy;
    - Director, Small Business Programs;
    - Director, Systems and Software Engineering;
    - Director, Portfolio Systems Acquisition;
    - Director, Joint Advanced Concepts;
    - Director, Defense Procurement & Acquisition Policy & Strategic Sourcing;
    - President, Defense Acquisition University;
    - Director, Defense Contract Management Agency.

- *Director, Defense Research and Engineering*: Principal advisor to the USD(AT&L) for scientific and technical matters, and supervises the following:
-
    - Deputy Under Secretary for International Security Policy;
    - Deputy Under Secretary for Advanced Systems and Concepts;
    - Deputy Under Secretary for Science and Technology;
    - Deputy Under Secretary for Laboratory and Basic Sciences;
    - Director, Plans and Programs;
    - Director, Rapid Reaction Technology Office;
    - Director, Defense Advanced Research Projects Agency;
    - Director, Defense Technical Information Center.

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

    - Assistant Deputy Under Secretary for Supply Chain Integration;
    - Assistant Deputy Under Secretary for Maintenance Policy;
    - Assistant Deputy Under Secretary for Transportation Policy;
    - Assistant Deputy Under Secretary for 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.

- *Deputy Under Secretary of Defense for Business Transformation*: Leads business transformation for DoD, working across the military services and defense agencies to drive rapid transformation of business processes and systems to ensure improved support to the warfighter and improved financial accountability. He or she also oversees the Business Transformation Agency, the organization accountable for delivery of common processes and systems supporting logistics, acquisition, finance, and personnel activity across DoD.

- *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, Human Capital Initiatives (also serves as president, DAU);
> - Director, International Cooperation;
> - Director, Acquisition Resources and Analysis;
> - Director, Space and Intelligence Capabilities;
> - 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 the earned value management system processes, 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 and Software Engineering*: Reviews systems engineering plans for ACAT ID programs and provides policy and oversight of developmental test and evaluation activities within the departments and agencies.

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

Defense Space Acquisition Board (DSAB)

A DSAB is convened at each decision point for ACAT ID space acquisition programs to assess the readiness of these programs to proceed into the next phase of the acquisition process. The USD(AT&L) chairs the DSAB and the Vice Chairman of the Joint Chiefs of Staff is the co-chair. DSAB principals are advisors and representatives of entities who have a material interest in the program under consideration. An Acquisition Decision Memorandum 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. 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.

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, which 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 & Marine Corps)	• Assistant Secretary of the Navy (Research, Development and Acquisition)
• Air Force Integrated Product Teams/ Acquisition Strategy Panels/Air Force Review Board	• Assistant Secretary of the Air Force (Acquisition)

6

DETERMINING JOINT WARFIGHTING NEEDS

This chapter focuses on a capabilities-based approach to identifying current and future gaps in the ability to carry out joint warfighting missions and functions 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, Joint Capabilities Integration and Development System (JCIDS), provide policy and procedures for identifying, describing and justifying the needs for future warfighting capabilities."[8]

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

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[8] As of publication of this booklet, the CJCS 3170 series of May 2007 were under revision.

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.

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 and demonstration phase of the acquisition process.

During the engineering and manufacturing development and demonstration 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 and demonstration 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.
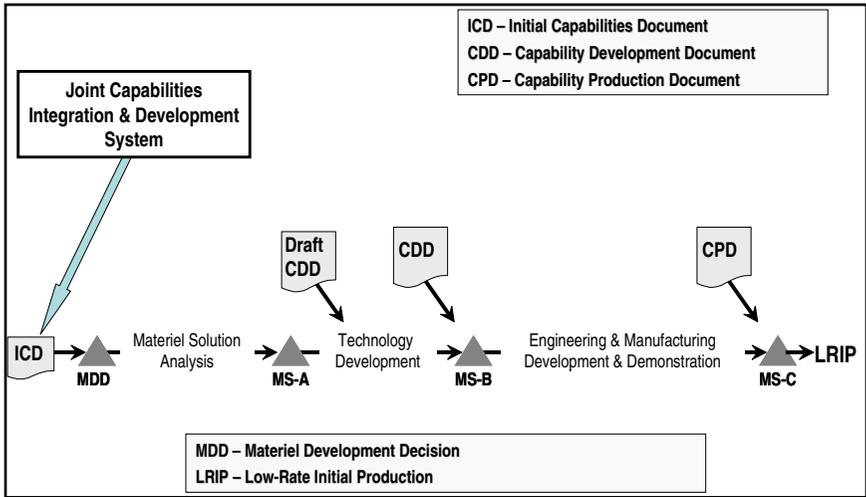
Figure 6-1. JCIDS Process & Acquisition Decisions

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 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 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.
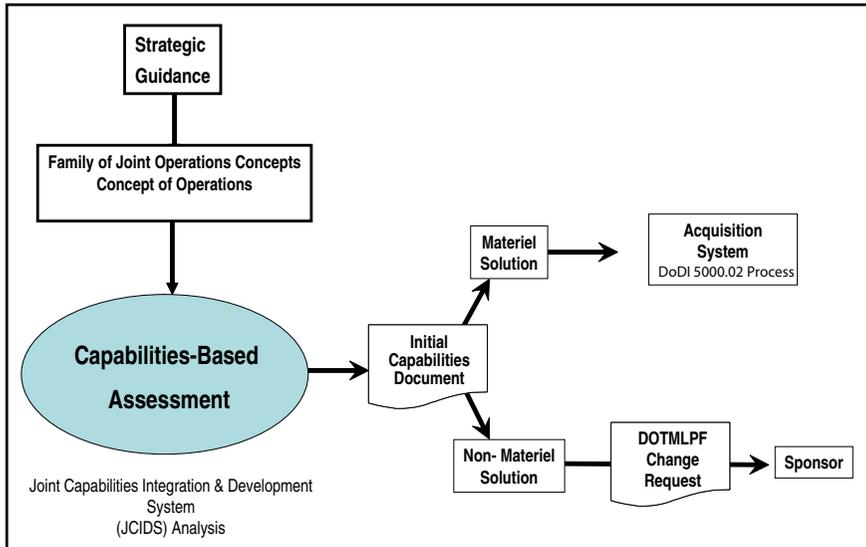
Figure 6-2. Capabilities-Based Assessment Process

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 CJCS 3170 series mentioned earlier.

Functional Capability Boards

The JROC charters FCBs 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, protection, 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 non-materiel, 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 ac-

quisition 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 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 list of web sites after last chapter).

Testing of C4I Interoperability Requirements

All command, communication, control, computer, and intelligence (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 and operational

testing whenever possible to conserve resources. The Joint Staff, J-6, certifies whether a system meets its interoperability requirements based on results of the testing.
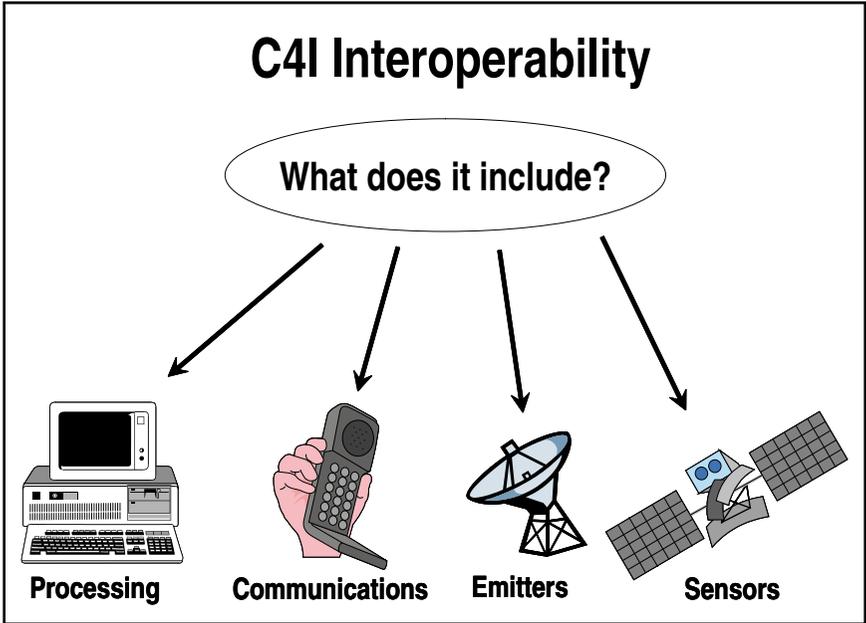
Figure 6-3. Command, Control, Communications, Computers, and Intelligence Interoperability

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 Materiel Development Decision precedes entry into any phase of the acquisition management system*
- *Entrance criteria met before entering phases*
- *Evolutionary Acquisition or Single Step to Full Capability*

User Needs

Technology Opportunities & Resources

| A | | B | Program Initiation | C | IOC | FOC |

| Materiel Solution Analysis | Technology Development | Engineering & Manufacturing Development | | Production & Deployment | Operations & Support |

Materiel Development Decision

Post-PDR Assessment   Post-CDR Assessment

FRP Decision Review

Pre-Systems Acquisition   Systems Acquisition   Sustainment

◇ Decision Point   △ Milestone Review   ◇ Decision Point of PDR is not conducted before Milestone B

Initial Capabilities Document   *Capability Development Document*   *Capability Production Document*

Relationship to JCIDS

Figure 7-1. Defense Acquisition Management System

 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 the framework with which to review acquisition programs, monitor and administer progress, identify problems, and make corrections. The milestone decision authority (MDA) will approve entrance into the appropriate phase or effort of the acquisition process by signing an acquisition decision memorandum upon completion of a successful decision review.

The life cycle 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.

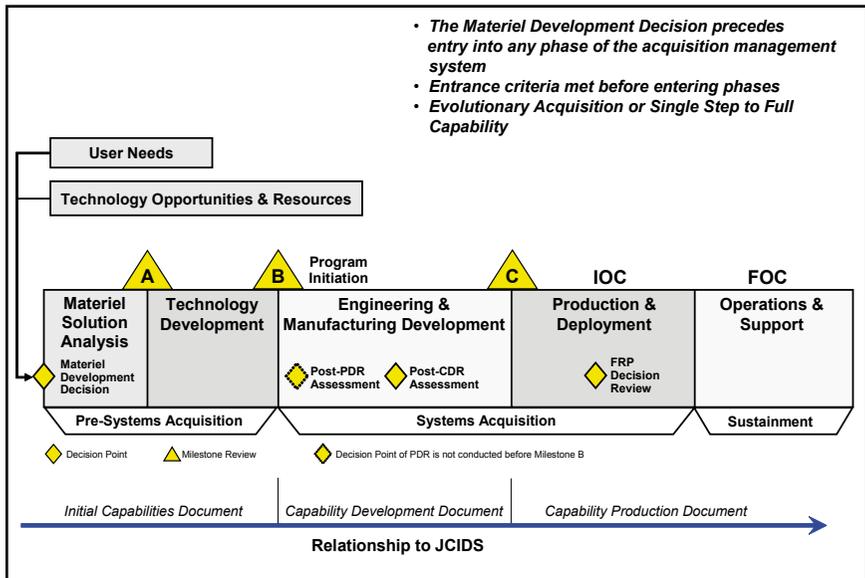**Technological Opportunities and User Needs**

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, the Defense Acquisition Challenge Program, and others.

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 applicable 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 one size fits all; each program structure must be based on that program's unique set of requirements and available technology. The process of adjusting the life cycle to fit a particular set of programmatic circumstances is often referred to as "tailoring." The number of phases, key activities, and decision points are tailored by the 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 Joint Capabilities Integration and Development System (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 Solution Analysis Phase begins with a materiel development decision (MDD) by the MDA. The MDD is the formal entry point into the acquisition process and is mandatory for all programs. 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. A technology development strategy is 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 and demonstration 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, 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

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[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.

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.

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 completion of operational (and live-fire, where applicable) testing. The MDA determines the LRIP quantity for ACAT I and II programs at Milestone B. LRIP is not applicable to automated information systems or software-intensive systems with no developmental hardware; however, a limited deployment phase may be applicable. LRIP for ships and satellites is production of items at the minimum quantity and rate 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 lifecycle (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 (http://akss.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, modifica-

tion, 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 systems' 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.
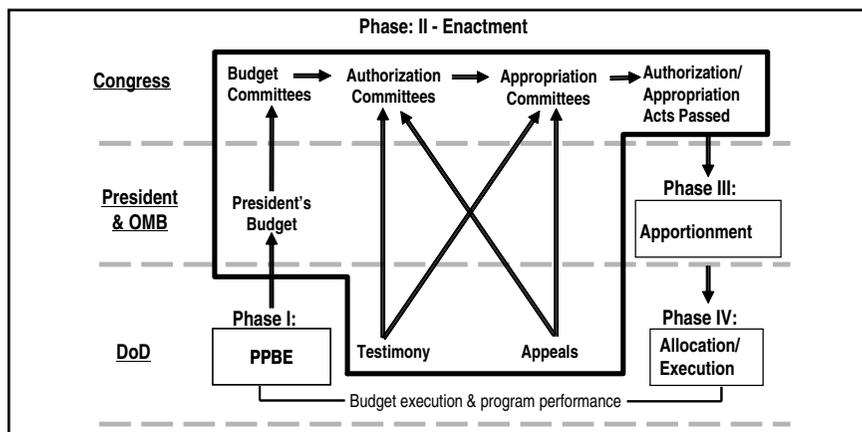

Figure 8-1. Resource Allocation Process

Phase I—Planning, Programming, Budgeting, and Execution Process

PPBE (originally introduced as the Planning, Programming, and Budgeting System) is the process that produces DoD's portion of the President's budget. It is a biennial (2-year) cycle during which DoD formulates 2-year budgets in even-numbered calendar years, called the "on-year," and then uses the "off year" (odd-numbered calendar years) to focus on budget execution and program performance. During the on-year, PPBE produces the *Guidance for Development of the Force (GDF)*; the *Joint Programming Guidance (JPG)*; a program objectives memorandum (POM) for each military department, defense agency, and other agencies/offices. Updates to the Future Years Defense Program (FYDP) occur during both on and off years, and a DoD budget is produced every year. During the off-year, the GDF may be issued at the discretion of the Secretary of Defense. Small programmatic adjustments will be allowed during the off year to reflect real-world changes. The following chart shows responsibility for each product.

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

The Deputy Secretary of Defense manages PPBE and makes recommendations for decisions to the Secretary of Defense. The Deputy's Advisory Working Group (DAWG), co-chaired by the Deputy Secretary of Defense and the Chairman of the Joint Chiefs of Staff, is the panel that provides oversight of PPBE activities. The DAWG membership includes the Under Secretaries of Defense, the Vice Chairman of the Joint Chiefs of Staff, the Service Vice Chiefs of Staff, the Assistant Commandant of the Marine Corps, the military department under secretaries, the Assistant Secretary of Defense for Network Integration and Information (ASD[NII]), the Principal Deputy Under Secretary of Defense for Policy, the Director of Program Analysis and Evaluation (PA&E), and the Deputy Commander for U.S. Special Operations Command. The Director, PA&E serves as executive secretary.

Off/On Year Activities

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

Year 1. Off Year: The first year of a new presidential administration and an off year (odd numbered calendar year) for PPBE. The budget submitted to Congress has been developed by the outgoing administration, and the budget being executed reflects the policies of the previous administration. Activities during this year may include supplemental budget requests to Congress to start reorienting spending in accordance with policies of the new administration. Since this is an off year for PPBE, there will be no POM or Budget Estimate Submit (BES) to the Office of the Secretary of Defense; however, programmatic and budget changes to the previous administration's on-year baseline will be accomplished by change proposals developed by the departments and agencies during the spring and summer. A program/budget review will be conducted in the fall (September through November) based on input from the change proposals that will result in the submission of the President's budget to Congress in February.

In the first year of a new administration, the President's national security strategy (NSS) must be issued within 150 days of taking office. The NSS will provide top-level guidance for conduct of the *QDR*, and provide guidance for the Secretary of Defense to develop national defense strategy and the Chairman of the Joint Chiefs of Staff to develop the national military strategy (NMS). The NMS will be reflected in the *QDR* and in an NMS document. For subsequent years, the NSS is due with submission of the President's budget. The NMS is updated by the Chairman of the Joint Chiefs of Staff only when necessary.

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

Year 2. On Year: The second year of a new administration and an on year (even-numbered calendar year) for PPBE. The *QDR* is submitted concurrent with the President's budget in February. The defense planning guidance is issued around May followed by a concurrent POM/budget process. The departments and agencies will submit their POM and BES in August. Adjustments will be made in the FYDP and the DoD input to the President's budget will be finalized. Concurrent with the fall Office of the Secretary of Defense assessment of the POMs and budget estimates, a program/budget execution review of the previous budget execution year will be conducted.

Year 3. Off Year: The third year of a new administration and another off-year for PPBE. As this is the 2nd off-year, there is no requirement for a *QDR*. There may be an NSS issued by the White House and the NMS may be updated, depending on the security environment. The issuance of an off-year GDF is optional with the Secretary of Defense. Programmatic and budget changes to the last on-year baseline will be again accomplished by change proposals. Drafting of the on-year GDF is started during the off-year program, budget, and execution review. The change proposal process will again result in a new DoD budget.

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

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 8-2, next page).

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.
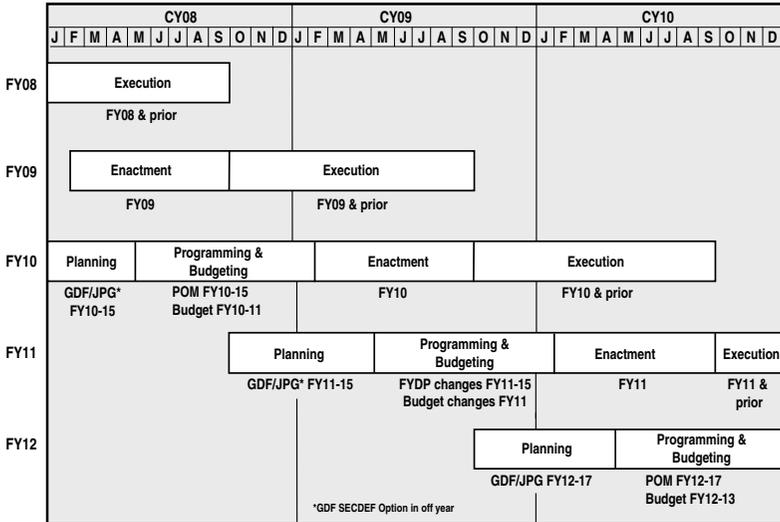
	CY08	CY09	CY10
	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
FY08	Execution		
	FY08 & prior		
FY09	Enactment	Execution	
	FY09	FY09 & prior	
FY10	Planning / Programming & Budgeting	Enactment	Execution
	GDF/JPG* FY10-15 / POM FY10-15 Budget FY10-11	FY10	FY10 & prior
FY11		Planning / Programming & Budgeting	Enactment / Execution
		GDF/JPG* FY11-15 / FYDP changes FY11-15 Budget changes FY11	FY11 / FY11 & prior
FY12			Planning / Programming & Budgeting
		*GDF SECDEF Option in off year	GDF/JPG FY12-17 / POM FY12-17 Budget FY12-13

Figure 8-2. Resource Allocation Process – Overlap

WORLD WIDE WEB SITES

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 Knowledge Sharing System	http://akss.dau.mil
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 3170.01C and CJCS Manual 3170.01	www.dtic.mil/cjcs_directives
Defense Acquisition Guidebook	http://akss.dau.mil/dag
Defense Acquisition University	www.dau.mil
Defense Acquisition University Continuous Learning Center	http://clc.dau.mil
Director, Program Analysis & Evaluation	www.pae.osd.mil
Director, Operational Test & 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

Organization/Document	WWW Location
Federal Acquisition Regulation (FAR)	www.acq.osd.mil/dpap/dars/far.html
Defense FAR Supplement (DFARS)	www.acq.osd.mil/dpap/sitemap.html
Office of the Secretary of Defense	www.defenselink.mil
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