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DEFENSE ACQUISITION GUIDEBOOK

FOREWORD

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. In that context, our continued objective is to rapidly acquire quality products that satisfy user needs with measurable improvements to mission capability at a fair and reasonable price. The fundamental principles and procedures that the Department follows in achieving those objectives are described in DoD Directive 5000.1 and DoD Instruction 5000.2. The Defense Acquisition Guidebook is designed to complement those policy documents by providing the acquisition workforce with discretionary best practice that should be tailored to the needs of each program.

Acquisition professionals should use this Guidebook as a reference source supporting their management responsibilities. As an "on-line" resource, the information is limited only by the user's interest or need. Some chapters contain general content; they provide individual topic discussions and describe processes and considerations that will improve the effectiveness of program planning. Some chapters may provide a tutorial on the application of these topics to the acquisition framework. Depending on the subject matter, a chapter may contain general background information, tutorial discussions, and/or discussions of the detailed requirements for each milestone decision and phase. All chapters contain non-mandatory staff expectations for satisfying the mandatory requirements in DoD Instruction 5000.2.

Each chapter is designed to improve understanding of the acquisition process and ensure adequate knowledge of the statutory and regulatory requirements associated with the process. Discussions, explanations, and electronic links to related information enable the "reader" to be efficient, effective, innovative, and disciplined, and to responsively provide warfighting capability. Each chapter lists potential ways the program manager or assigned manager can satisfy mandatory process requirements and meet staff expectations for other activities. Differences of view regarding discretionary practice will be resolved by the Milestone Decision Authority.

The Guidebook should be viewed as an electronic resource rather than a "book." The "reader" "navigates" the information instead of "leafing" through hundreds of physical, collated pages. Navigation is electronic movement through the reference system. There are three ways to view the information:

- Select the Document View tab to review Guidebook information page-by-page.
- Select the Lifecycle Framework tab to review statutory and regulatory requirements and related best practice for each Milestone and acquisition phase. And
- Select the Functional/Topic View tab to review comprehensive discussions of key acquisition topics.

(There is also an on-line tutorial available that goes into greater detail and describes the full capability provided by the Guidebook.)

At the chapter level, you may scroll up and down through the text, and jump between previous and next paragraphs. Throughout the text, hyperlinks let you electronically jump to related information. Many times, the links take you to another paragraph in the Guidebook. Some links take you to related text in either acquisition policy documentsor the Joint Capabilities Integration and Development System documents. Other links will take you to external references, such as United States Code, the Federal Acquisition Regulation, or other formal DoD publications. Still others will take you to related, informal sources that are rich in information, such as the various Defense Acquisition University Communities of Practice.

To maximize the utility of this system, we recommend you use a computer that has Internet Explorer 6.x or higher, and is JavaScript enabled. The hardware requirement is whatever is necessary to support Internet Explorer 6.

Overview of the Defense Acquisition Guidebook

This Guidebook contains the following 11 chapters:

Chapter 1, *Department of Defense Decision Support Systems*, presents an overview of the Defense Department's decision support systems for strategic planning and resource allocation, the determination of capability needs, and the acquisition of systems.

Chapter 2, *Defense Acquisition Program Goals and Strategy*, discusses acquisition program goals and the topics the program manager should consider in developing a strategy for the acquisition program. It addresses the required information associated with the Acquisition Program Baseline and the program's Acquisition Strategy

Chapter 3, *Affordability and Lifecycle Resource Estimates*, addresses acquisition program affordability and resource estimation.

Chapter 4, *Systems Engineering*, covers the system design issues facing a program manager, and details the systems engineering processes that aid the program manager in designing an integrated system that results in a balanced capability solution.

Chapter 5, *Lifecycle Logistics*, provides the program manager with a description of Lifecycle Logistics and its application throughout the system life cycle, from concept to disposal.

Chapter 6, *Human Systems Integration*, addresses the human systems elements of the systems engineering process. It will help the program manager design and develop systems that effectively and affordably integrate with human capabilities and limitations; and it makes the program manager aware of the staff resources available to assist in this endeavor.

Chapter 7, *Acquiring Information Technology and National Security Systems*, explains how the Department of Defense complies with statutory and regulatory requirements for acquiring IT and NSS systems and is using a network-centric strategy to transform DoD

warfighting, business, and intelligence capabilities. The chapter also provides descriptions and explanations of the Clinger-Cohen Act, the Business Management Modernization Program and many other associated topics and concepts, and discusses many of the activities that enable the development of net-centric systems.

Chapter 8, *Intelligence, Counterintelligence, and Security Support*, describes program manager responsibilities regarding research and technology protection to prevent inadvertent technology transfer, and provides guidance for and describes the support available for protecting those technologies.

Chapter 9, *Integrated Test and Evaluation*, discusses many of the topics associated with test and evaluation, to include oversight, Developmental Test and Evaluation, Operational Test and Evaluation, and Live Fire Test and Evaluation. The chapter enables the program manager to develop a robust, integrated test and evaluation strategy to assess operational effectiveness and suitability, and to support program decisions.

Chapter 10, *Decisions, Assessments, and Periodic Reporting*, prepares the program manager and Milestone Decision Authority to execute their respective oversight responsibilities.

Chapter 11, *Program Management Activities*, explains the additional activities and decisions required of the program manager, not otherwise discussed in earlier chapters of this Guidebook.

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CHAPTER 5
Life Cycle Logistics (LCL)

5.0. Overview

5.0.1. Purpose

This chapter provides program managers with a description of Life-Cycle Logistics (LCL) and its application in the acquisition and sustainment phases. A fundamental change in DoD policy is the designation of the program manager as the life cycle manager (Total Life Cycle Systems Management (TLCSM)), responsible for effective and timely acquisition and sustainment of the system throughout its life cycle. T he program manager is responsible for providing the needed product support capability to maintain the readiness, sustainment and operational capability of a system. Emphasis is placed on increasing reliability and reducing logistics footprint in the systems engineering process, and providing for effective product support using performance based logistics (PBL) strategies. Performance Based Logistics strategies may be applied at the system, subsystem, or major assembly level depending upon program unique circumstances and appropriate business case analysis. This approach is depicted in Figure 5.0.1.1.

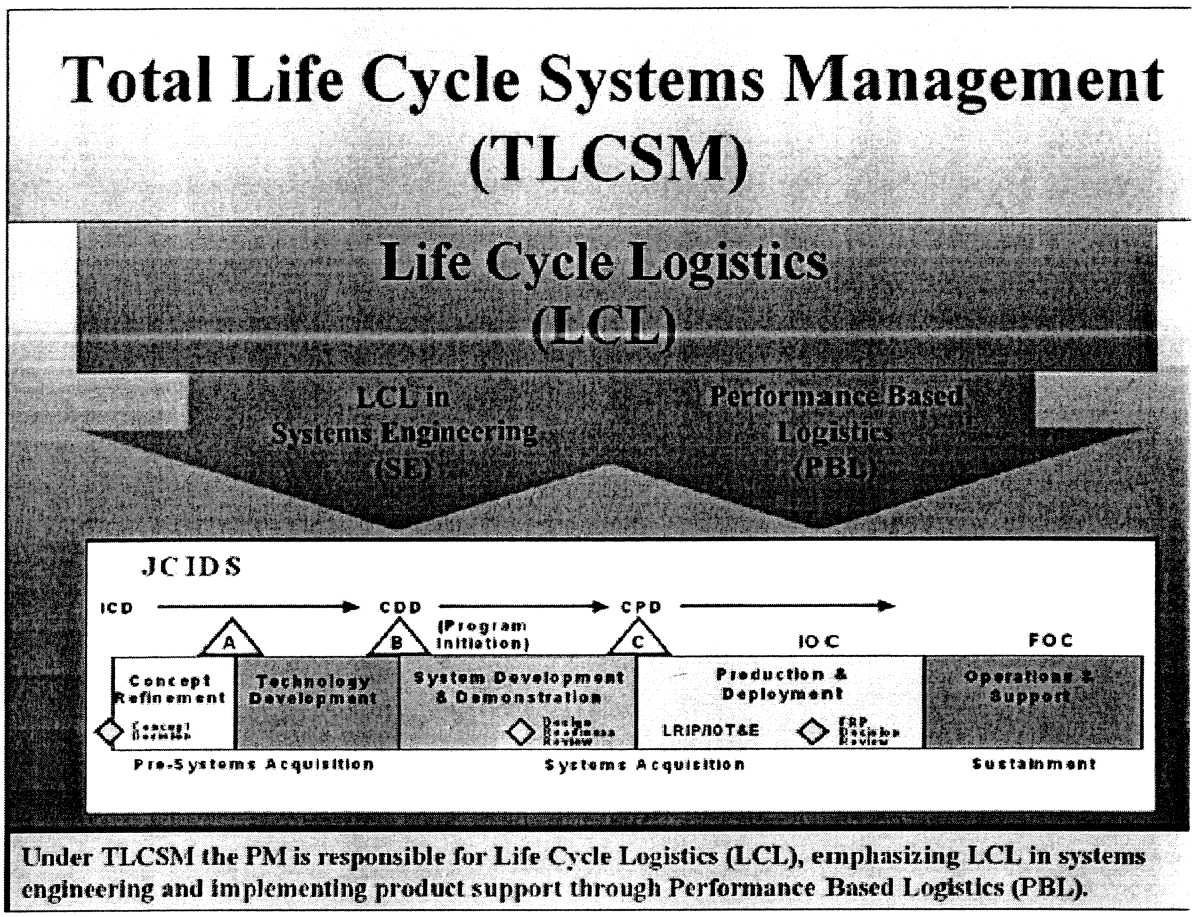

Figure 5.0.1.1. Overview

5.0.2. Contents

The first four sections of this chapter correspond to the elements depicted in Figure 5.0.1.1 :

Section 5.1, Life-Cycle Logistics (LCL), describes LCL, explains its role under Total Life-Cycle Systems Management, and identifies the Program Manager's main LCL responsibilities. It also identifies DoD's overall logistics goals, providing context for the conduct of all LCL related activities.

Section 5.2, LCL in Systems Engineering, discusses LCL in Systems Engineering, focusing primarily on achieving affordable systems operational effectiveness. LCL considerations are addressed in the Joint Capabilities Integration and Development System process, demonstrated in Test and Evaluation, and implemented in fielding and Sustainment of the system. The concept of "design for support, support the design" is presented in this section.

Section 5.3, Performance Based Logistics, discusses DoD's preferred approach to product support, Performance Based Logistics, and provides a step-by-step process for implementing Performance Based Logistics. Performance Based Agreements and Source of Support are also discussed.

Section 5.4, Key LCL Activities in the System Life Cycle, identifies key LCL activities in each phase of a program, whether it is a major new system, a modification to a fielded system, or a redesign of a product support system. This section applies the concepts and actions discussed in the previous sections, placing them sequentially in the Defense Acquisition Management Framework to demonstrate when LCL-related activities take place.

In addition, Section 5.5, LCL Tools and References, provides LCL tools and references. These tools and references provide further explanation of critical items discussed in the chapter, as well as examples, templates, and other useful tools for LCL implementation.

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5.2. Life-Cycle Logistics (LCL) in Systems Engineering (SE)

Program management teams manage programs "through the application of a systems engineering approach that optimizes total system performance and minimizes total ownership costs" (DoD Directive 5000.1). Due to the nature of evolutionary acquisition and incremental/spiral development strategies, there is no longer a clear and definable line between design, development, deployment, and sustainment. Effective sustainment of weapons systems begins with the design and development of reliable and maintainable systems through the continuous application of a robust systems engineering methodology that focuses on total system performance.

LCL should be considered early and iteratively in the design process, and life cycle supportability requirements are an integral part of the systems engineering process. A detailed discussion of the systems engineering process can be found in section 4.2 of this Guidebook. Also see Designing and Assessing Supportability in DoD Weapon Systems: A Guide to Increased Reliability and Reduced Logistics Footprint (the 'Supportability Guide'). Additional discussion of LCL activities by acquisition phase can be found in section 5.4 of this Guidebook.

Demonstration of assured supportability and Lifecycle affordability should also be an entrance criterion for the Production and Deployment Phase. The specific requirements associated with integrating the support strategy into the system engineering process can be accomplished through IPPD.

This section first provides a list of LCL Considerations for systems engineering. Next it focuses on the achievement of affordable system operational effectiveness during Pre-Acquisition and Acquisition, including Joint Capabilities Integration and Development System analyses, design, Test and Evaluation, and Production (Design for Support). Finally, it briefly discusses LCL during Sustainment, to include Deployment, Operations, and Support (Support the Design).

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5.2.1. Life-Cycle Logistics (LCL) Considerations for Systems Engineering

The following are recommended considerations in managing Life-Cycle Logistics -related systems engineering activities, including Joint Capabilities Integration and Development System, design, test and evaluation, fielding, and sustainment.

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5.2.1.2. Condition Based Maintenance Plus (CBM+)

Program managers are required to "optimize operational readiness through affordable, integrated, embedded diagnostics and prognostics, ... automatic identification technology; and iterative technology refreshment" (DoD Instruction 5000.2). It is also Department of Defense policy that Condition Based Maintenance (CBM) be "implemented to improve maintenance agility and responsiveness, increase operational availability, and reduce life cycle total ownership costs" (DUSD(LMR) Memorandum, November 2002, CBM+). The goal of CBM is to perform maintenance only upon evidence of need. CBM tenets include: designing systems that require minimum maintenance; need-driven maintenance; appropriate use of embedded diagnostics and prognostics through the application of RCM; improved maintenance analytical and production technologies; automated maintenance information generation; trend based reliability and process improvements; integrated information systems providing logistics system response based on equipment maintenance condition; and smaller maintenance and logistics footprints. Condition Based Maintenance Plus (CBM+) expands on these basic concepts, encompassing other technologies, processes, and procedures that enable improved maintenance and logistics practices. CBM+ can be defined as a set of maintenance processes and capabilities derived, in large part, from real-time assessment of weapon system condition, obtained from embedded sensors and/or external tests and measurements. Ultimately, these practices can increase operational availability and readiness at a reduced cost throughout the weapon system life cycle. The design specifications should identify early teaming with systems engineering to clearly define and understand the operating envelope in order to design in Built-In-Test (BIT) and Built-In-Self-Test (BIST) mechanisms including false alarm mitigation.

Diagnostics: Applicable and effective on-board monitoring/recording devices and software, e.g. built-in test (BIT), that provide enhanced capability for fault detection and isolation, thus optimizing the time to repair. Emphasis must also be on accuracy and minimization of false alarms (DoD Instruction 5000.2).

Prognostics: Applicable and effective on-board monitoring/recording devices and software, e.g. BIT, that monitor various components and indicate out of range conditions, imminent failure probability, and similar proactive maintenance optimization actions (DoD Instruction 5000.2).

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