

2005 Technical Information Division Annual Conference, Miami, FL

3-4 March 2005

Configuration Management, Logistics, and Universal CM Issues by Mr. Larry Bauer, Boeing Commercial Airplanes Transforming Logistics by Mr. Jerry Beck, OADUSD(LPP)

Configuration Management and Data Management in DODD 5000.1 by Dr. Jay Billings, President, Defense Systems Corporation

2005 CDM Certification and Apprentice Tutorial by Mr. Charles Billingsley

Industry Keynote - Adapting Logistics Capabilities to National Security Requirements by LTG Peter Cuviello, USA (Ret.) Vice President and Managing Director, Lockheed Martin Focused Logistics Enterprise

Integration of Systems Engineering & Supportability by Mr. Joe Grosson, Executive Director, Focused Logistics Enterprise & Corp.

Pre-Systems Acquisition Activities - Life Cycle Data Management in Handbook 859 by Ms. Cynthia C. Hauer, Millennium Data Management, Incorporated

EIA-836 CM Data Exchange and Interoperability - CM Data to Support the Logistics Process by Mr. Alan Lager, MLR Associates

Army Aviation - Logistics For The Warfighter by Dr. Thomas Pieplow, Associate Director for Aviation, AMCOM

IEEE Std 828-1990 - IEEE Standard for Software Configuration Management Plans by Mr. Gaston Ray, General Dynamics Advanced Information Systems

Military Engineering Data Asset Locator System (MEDALS) Data Quality by Mr. Warren M Scott, Program Manager, Military Engineering Data Assets Locator Sytems (MEDALS), Defense Logistics Agency

Annual Symposium

Friday, March 4, 2005

7:30 a.m.	Registration & Coffee Service
8:30 a.m.	Session 2 Pre-Systems Acquisition – Handbook 859 Ms. Cynthia Hauer, President & CEO, Millennium Data Management, Inc.
	EIA-836 CM Data Exchange & Interoperability; CM Data to Support the Logistics Process Mr. Al Lager, MLR Associates
10:00 a.m.	Break
10:30 a.m.	Session 3 Industry CM Standards, Handbooks and Logistics Relationships Mr. Larry Bauer, Boeing Commercial Airplanes
	Military Engineering Data Assets Locator System Mr. Warren Scott, Program Manager, Military Engineering Data Assets Locator System (MEDALS), Defense Logistics Agency, Battle Creek, Michigan
12:00 p.m.	Lunch (Stern's Award) – Lunch is provided as a part of your registration fee
1:30 p.m.	Session 4: Production and Development
	Configuration Management/Data Management in DoDD 5000.1 Mr. Jay Billings, President, Defense Systems Corporation
	Planning for Software CDM – IEEE STD 828-1990 Mr. Gaston Ray, General Dynamics Advanced Information Systems
3:00 p.m.	Break
3:30 p.m.	Adjourn Meeting





Introduction for the Implementation of Software Configuration Management



F.O.C.U.S.ed Enterprises (www.focusedenterprises.com)

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ISO/IEC 12207 – 1995: Standard for Information Technology – Software Life Cycle Processes

IEEE/EIA 12207.0 – 1996: Software Life Cycle Processes

IEEE/EIA 12207.1 – 1998: Software Life Cycle Processes – Life Cycle Data

IEEE/EIA 12207.2 – 1998: Software Life Cycle Processes – Implementation Considerations

F.O.C.U.S.ed Enterprises (www.focusedenterprises.com)

Abstract

ISO/IEC 12207 provides a common <u>framework for developing</u> and managing software. IEEE/EIA 12207.0 consists of the <u>clarifications</u>, additions, and changes accepted by the Institute of Electrical and Electronics Engineers (IEEE) and the Electronic Industries Alliance (EIA) as formulated by a joint project of the two organizations. IEEE/EIA 12207.0 contain <u>concepts and</u> <u>guidelines to foster better understanding and application of the</u> <u>standard</u>. Thus this standard provides industry a basis for software practices that would be useable for both national and international business.

• Purpose: This International Standard establishes a common framework for software life cycle processes, with well-defined terminology, that can be referenced by the software industry. It contains processes, activities, and tasks that are to be applied during the acquisition of a system that contains software, a stand-alone software product, and software service and during the supply, development, operation, and maintenance of software products. Software includes the software portion of firmware.

This International Standard also provides a process that <u>can be</u> <u>employed for defining, controlling, and improving software life</u> <u>cycle processes</u>.

•Application: Applies to the acquisition of systems and software products and services, to the supply, development, operation, and maintenance of software products, and to the software portion of firmware, whether performed internally or externally to an organization.

4. Application of this International Standard (Clause 4) (pg 6)

This clause presents the software life cycle that can be <u>employed</u> to acquire, supply, develop, operate, and maintain software products. The objective is to provide a road map for the users of this International Standard so that they can orient themselves in it and apply it judiciously.

4.1.1 Life Cycle Processes: This International Standard groups the activities that may be performed during the life cycle of software into five primary processes, eight supporting processes, and four organizational processes. Each life cycle process is divided into a set of activities; each activity is further divided into a set of tasks. Subclause numbering a.b denotes a process, a.b.c an activity, and a.b.c.d a task. These life cycle processes are introduced below in depicted in figure 1 (see pg 7).



5 Primary Life Cycle Processes (Clause 5) (pg 9):

This clause defines the following primary life cycle processes:

- **5.1 Acquisition process;**
- **5.2 Supply process;**
- **5.3 Development process;**
- 5.4 Operation process;
- 5.5 Maintenance process.

The activities and tasks in a primary process are the responsibility of the organization initiating and performing that process. This organization ensures that the process is in existence and functional.

- 4.1.1.1 Primary Processes [task] (pg 6):
 - 1) Acquisition Process (subclause 5.1) [process]: Defines the activities of the acquirer, the organization that acquires a system, software product or software service.
 - 2) Supply Process (subclause 5.2): Defines the activities of the supplier, the organization that provides the system, software product or software service to the acquirer.
 - 3) Development Process (subclause 5.3): Defines the activities of the developer, the organization that defines and develops the software product.

- 4) Operation Process (subclause 5.4): Defines the activities of the operator, the organization that provides the service of operating a computer system in its live environment for its users.
- 5) Maintenance Process (subclause 5.5): Defines the activities of the maintainer, the organization that provides the service of maintaining the software product; that is, managing modifications to the software product to keep it current and in operational fitness. This process includes the migration and retirement of the software product.

4.1.1.1 Primary Processes [task] (pg 6):

- 3) Development Process: Defines the activities of the developer, the organization that defines and develops the software product.
 - Process Implementation
 - System Requirements Analysis
 - System Architectural Design
 - Software Requirements Analysis
 - Software Architectural Design
 - Software Detailed Design
 - Software Coding and Testing
 - Software Integration
 - Software Qualification Testing
 - System Integration
 - System Qualification Testing
 - Software Installation
 - Software Acceptance Support

5.3.11 System Qualification Testing. This activity consists of the following tasks, which the developer shall perform or support as required by the contract.

5.3.11.1. System qualification testing shall be conducted in accordance with the qualification requirements specified for the system. It shall be ensured that the implementation of each system requirement is tested for compliance and that the system is ready for delivery. The qualification testing results shall be documented.

5.3.11.2. The system shall be evaluated considering the criteria listed below. The results of the evaluations shall be documented.

- a) Test coverage of system requirements.
- b) Conformance to expected results.
- c) Feasibility of operation and maintenance.

5.3.11.3. The developer shall support audit(s) in accordance with 6.7. The results of the audit(s) shall be documented.

5.3.11.4. Upon successful completion of the audit(s), if conducted, the developer shall:

- a) Update and prepare the deliverable software product for Software Installation and Software Acceptance Support.
- b) Establish a baseline for the design and code of each software configuration item.



- 8 Supporting Life Cycle Processes (Clause 6) (pg. 27):
 - This clause defines the following supporting life cycle processes:
 - 6.1 [a process] Documentation Process;
 - 6.2 Configuration Management Process;
 - 6.3 Quality Assurance Process;
 - 6.4 Verification Process;
 - 6.5 Validation Process;
 - 6.6 Joint Review Process;
 - 6.7 Audit Process;
 - 6.8 Problem Resolution Process;



4.1.1.2 Supporting Life Cycle Processes (pg 6):

- 1) Documentation Process (subclause 6.1) [a process]. Defines the activities for recording the information produced by a life cycle process.
- 2) Configuration Management Process (subclause 6.2). Defines the configuration management activities.
- 3) Quality Assurance Process (subclause 6.3). Defines the activities for objectively assuring that the software products and processes are in conformance with their specified requirements and adhere to their established plans. Joint Reviews, Audits, Verification, and Validation may be used as techniques of Quality Assurance.

- 3) Verification Process (subclause 6.4). Defines the activities (for the acquirer, the supplier, or an independent party) for verifying the software products and services in varying dept depending on the software project.
- 4) Validation Process (subclause 6.5). Defines the activities (for the acquirer, the supplier, or an independent party) for validating the software products of the software project.
- 5) Joint Review Process (subclause 6.6). Defines the activities for evaluating the status and products of an activity. This process may be employed by any two parties, where one party (reviewing party) reviews another party (reviewed party) in a joint forum.

- 6) Audit Process (subclause 6.7). Defines that activities for determining compliance with the requirements, plans, and contract. This process may be employed by any two parties, where one party (auditing party) audits the software products or activities of another party (audited party).
- 7) Problem Resolution Process (subclause 6.8). Defines a process for analyzing and removing the problems (including nonconformances), whatever their nature or source, that are discovered during the execution of development, operation, maintenance, or other processes.

6.2 Configuration Management Process [a process] (pg. 29):

The Configuration Management Process is a process of applying administrative and technical procedures throughout the software life cycle to: Identify and define software items in a system; control modifications and releases of the items; record and report the status of the items and modification requests; ensure the completeness, consistency, and correctness of the items; and control storage, handling, and delivery of the items.

List of Activities:

6.2.1 Process Implementation [activity]. This activity consists of the following tasks:

6.2.1.1 A configuration management plan shall be developed [task]. The plan shall describe:

- The CM Activities;
- Procedures and Schedule for performing these activities;
- The organization(s) responsible for performing these activities;
- and their relationship with other organizations, such as software development or maintenance. The plan shall be documented and implemented.

6.2.2 Configuration Identification [activity]. This activity consists of the following tasks:

6.2.2.1 [task] A scheme shall be established for the identification of software items and their versions to be controlled for the project. For each software CI and its versions, the following shall be identified: the documentation that establishes the baseline; the version references; and other identification details.

6.2.3 Configuration Control. This activity consists of the following task:

6.2.3.1 The following shall be performed: identification and recording of change requests; analysis and evaluation of the changes; approval or disapproval of the request; and implementation, verification, and release of the modified software item. An audit trail shall exist, whereby each modification, the reason for the modification, and authorization of the modification can be traced. Control and audit of all accesses to the controlled software items that handle safety or security critical functions shall be performed.

6.2.4 Configuration Status Accounting. This activity consists of the following tasks:

6.2.4.1 Management records and status reports that show the status and history of controlled software items including baseline shall be prepared. Status reports shall include the number of changes for a project, latest software item versions, release identifiers, the number of releases, and comparisons of releases.

6.2.5 Configuration Evaluation. This activity consists of the following tasks:

6.2.5.1 The following shall be determined and ensured: the functional completeness of the software items against their requirements and the physical completeness of the software items (whether their design and code reflect an up-to-date technical description).

6.2.6 Release Management and Delivery. This activity consists of the following task:

6.2.6.1 The release and delivery of software products and documentation shall be formally controlled. Master copies of code and documentation shall be maintained for the life of the software product. The code and documentation that contain safety or security critical functions shall be handled, stored, packaged, and delivered in accordance with the policies of the organizations involved.



Four Organizational Processes (pg. 42):

The activities and tasks in an organizational process are the responsibility of the organization using that process. The organization ensures that the process is in existence and functional.

- 7.1 Management Process
- 7.2 Infrastructure Process
- 7.3 Improvement Process
- 7.4 Training Process

4.1.1.3 Organizational Life Cycle Processes (pg 8):

- 1) Management Process (subclause 7.1) [a process]. Defines the basic activities of the management, including project management, related to the execution of a life cycle process.
- 2) Infrastructure Process (subclause 7.2). Defines the basic activities for establishing the underlying structure of a life cycle process.
- 3) Improvement Process (subclause 7.3). Defines the basic activities that an organization (that is, acquirer, supplier, developer, operator, maintainer, or the manager of another process) performs for establishing, measuring, controlling, and improving its life cycle process.
- 4) Training Process (subclause 7.4). Defines the activities for providing adequately trained personnel.

SUMMARY

IEEE/EIA 12207.0: Software Life Cycle Processes

- Purpose: This International Standard establishes a <u>common framework for software life cycle</u> <u>processes</u>, with well-defined terminology, that can be referenced by the software industry.
- Application: Applies to the acquisition of systems and software products and services, to the supply, development, operation, and maintenance of software products, and to the software portion of firmware, whether performed internally or externally to an organization.

A. Five Primary Processes

- **1. Acquisition Process**
- 2. Supply Process
- 3. Development Process
- 4. **Operation Process**
- 5. Maintenance Process

B. Eight Supporting Processes

- 1. Documentation Process
- 2. Configuration Management Process
- 3. Quality Assurance Process
- 4. Verification Process
- 5. Validation Process
- 6. Joint Review Process
- 7. Audit Process
- 8. **Problem Resolution Process**

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C. Four Organizational Processes

- 1. Management Process
- 2. Infrastructure Process
- 3. Improvement Process
- 4. Training Process



Configuration Management, Logistics, and Universal CM Issues

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> NDIA Conference Miami March 4-5, 2005 larry.d.bauer@boeing.com

Configuration Management Standards Evolution



CM Overview

CM Functions per GEIA-649A

CM PLANNING & MANAGEMENT

CONFIGURATION **IDENTIFICATION**

Selection, tailoring, guidance, oversight

CONFIGURATION STATUS ACCOUNTING

Attributes, identifiers, baselines

CM information & status

CM OF

Separate in 649; CONFIGURATION Merged in 649A **DIGITAL DATA CHANGE** MANAGEMENT CONFIGURATION Assure data integrity Manage **VERIFICATION/AUDIT** changes

Verify performance & consistency

GEIA-HB-649 (DRAFT)

Implementation Guide for Configuration Management

- Handbook providing guidance for the implementation of a robust CM process regardless of:
 - product complexity,
 - size,
 - customer or
 - business objectives
- Provides advice and guidance for tailoring CM processes according to need and business requirements

GEIA-HB-649 (DRAFT) Implementation Guide for Configuration Management (Cont)

Targeted for release 2nd quarter 2005

NOT a replacement for MIL-HDBK-61

5 Functions of CM

- How do the 5 Functions of CM support Logistics?
 - Planning and Management
 - Identification
 - Change Management
 - Configuration Status Accounting
 - Verification and Audit
CM Planning and Management

To assure that the **appropriate CM processes, tools,** and activities are applied



- To establish CM organizational responsibilities
- To determine the necessary resources and facilities

CM Planning and Management (cont)

To provide a basis for continuous improvement



- To enhance the **maturity** of the enterprises process
- To ensure data preservation and interoperability

Configuration Identification

- Determines structure of the product & documentation
- Defines performance, interface & other attributes



Provides unique identity to product, components and documentation

Configuration Identification (cont)

- Prescribes identification marking
- Modifies product and document identifiers to reflect incorporation of major changes



- Maintains release control and baseline definition
- Provides reference for changes & corrective actions

Configuration Identification (cont)

- Correlates document revision level to product configuration
 - Enables user to distinguish between product versions



- Enables service person to correlate product to instructions
- Correlates units to warranty/service life

Configuration Change Management

- Enable change decisions to be based on knowledge of complete change impact
- Limit changes to those which are necessary or offer significant benefit



Facilitate evaluation of cost, savings & trade-offs

Configuration Change Management (cont)

- Ensure customer interests are considered
- Provide orderly communication of change information



- Preserve configuration control at product interfaces
- Maintain and control a current configuration baseline

Configuration Change Management (cont)

- Maintain consistency between product and documentation
- Document and limit variances



Facilitate continued supportability of the product after change

Configuration Status Accounting

- Enables retrieval of information concerning change decisions and change impacts
- Supports inquiries concerning future planning of design changes, investigation of design problems, warranties, shelf and operating life calculations, etc.
- Access to complete configuration information on a product, any individual product unit, or group of product units



Configuration Status Accounting

- Access to accurate identification of each delivered product unit
- Improves capability to identify, produce, inspect, deliver, operate, maintain, repair, and refurbish products
- Enhances availability of accurate information on spare parts and maintenance support
- Source for configuration history



Verification and Audit

- Ensure the product design provides the agreed to performance capabilities
- Validate the integrity of the configuration documentation



- Verify the consistency between a product and its configuration documentation
- Provide confidence in establishing a product baseline

Verification and Audit

- Ensure a known configuration as a basis for operation and maintenance instructions, training, spares and repair parts.
- Determine that an adequate process(es) is in place to provide continuing control of the configuration
- Provides for continuous CM process improvement



CM Support of Logistics

Provides current identification of:

- Items in inventory by location
- Maintenance, Repair and Service Manuals and Records

Provides Records of:

- Repairs
- Modifications
- Removals



CM Support of Logistics (CONT)

Validates:

- Inventory
- Location of items
- Configuration of in-service and retired items

Supports:

- Location of needed Spares
- Visibility of upgrades, qualified replacements, and authorized substitutions



Global CM and Universal CM Issues

- CM issues are common throughout industry and government
 - Supplier Management
 - Documentation Hierarchies
 - Efficient and Effective Change Management
 - Level of Rigor/intensity of CM processes in Product Development vs. Production
 - Control of Test/Development Configurations



Global CM and Universal CM Issues

CM issues are common throughout industry and government



- Tool selection and integration
- Control of multiple Software versions
- CM organization is popular after an accident or incident
- Accurate repair history
- Retrofit control

CM and Logistics - Summary

- Configuration Management provides logistics with accurate:
 - Configuration Identification
 - Configuration Change history
 - Inventory Management
 - Upgrade and Substitution visibility
 - Repair and Service records
 - Removal visibility





Transforming Logistics



Technical Information Division Symposium Achieving Knowledge-Enabled Logistics

Jerry Beck OADUSD(LPP)

3 March 2005

Near-Term Transformation Priorities (Joint Logistics Board)

- Implement meaningful and actionable metrics
- Accelerate Performance-Based Logistics
- Develop a way ahead for Maintenance Excellence
- Facilitate Distribution Process Owner success
- Streamline material flows
- Assess Customer Pay Opportunities
- Coordinate Logistics Enterprise Integration
- Rationalize a corporate DoD Logistics vision into a coherent Transformation Roadmap - Focused Logistics

Focused Logistics



line:

deliver more capability, require less support

Achieving Maintenance Excellence



Autonomic Logistics System



Autonomic Logistics System Provides an Affordable

Rapid Response Capability to the Warfighter

Army Stryker Vehicle

Integrated Weapon System Status and Health Management



Blackhawk HUMS

Description:

- On-board diagnostics and prognostics.
- Crash survivable cockpit voice and data recorder.
- Obtains real time vibration, rotor smoothing and aircraft health usage info.

Background:

- Successful HUMS demonstration ongoing.
- Proposed cost funds UH-60M integration.

<u>Benefits:</u>

- Obtains real time vibration, rotor smoothing and aircraft health usage info.
- Supports predictive methods to allow replacement of parts prior to catastrophic failure.
- Reduces O&S costs.
- Improves readiness.



PBL is Performance -Based Life Cycle Product Support

PBL Guidance: A strategy for weapon system product support that employs the purchase of support as an integrated, affordable, performance package designed to optimize system readiness. It establishes performance goals for a weapon system through a support structure based on long-term performance agreements with clear lines of authority and responsibility to continuously meet the users needs.

- >Functions That May Be the Responsibility of the Provider:
- Obsolescence Management
- Requirements Determination
- Engineering and Technical Services
- Configuration Management/Control
- Technology Insertion

- Transportation & Warehousing
- >Technical Data Management
- Retrograde Management
- FMS Support (If Applicable)
- Public/Private Partnerships or Teaming



PBL Applications



Where Tech Data Must Fit with War Fighter Vision



Network Centric Global Command & Control System

Global Joint Integrating Concept (JIC)

GCCS Definition Integrated Engagement Space Critical operational capabilities identified Global Combat Support System Integrated Engagement Space





How does Advanced Planning and Scheduling Fit in the Information Pyramid?



How do I transform data to decision support quality?

How does Advanced Planning and Scheduling Fit in the Solution Set?



Where does APS fit into my solution set framework?

APS Provides Business Intelligence to the Value Chain



How does APS relate to the Material Readiness Value Chain?

The Impact of IDE

As JTAV is replaced by IDE AV, users, customers, and process owners will be provided timely and accurate information on the location, movement, status, and identity of units, personnel, equipment and supplies

This facilitates the capability to act upon that information to improve overall performance of DoD's logistics practices



How Else Does IDE Contribute to Asset Visibility and Overall Interoperability?



Tasking from PPP Tiger Team

- Establish a Technical Data Subgroup to define a road ahead - Work with AIA -Begin Jan 05, report out 60 days thereafter - Opportunity Areas Identified
 - Technical Publications
 - Product Data Management
 - Professional Development
 - Technology Development

Tech Data Areas of Opportunity

- I. Technical Publications: Expedite transition from paper to interactive electronic format
- II. Product Data Management (PDM): Foster early integration of acquisition and sustainment data management systems into a "life cycle" system to improve reliability and decrease logistics footprint

Tech Data Areas of Opportunity

- III. Professional Development: Ensure both developers and users of tech data understand their roles in contributing to sustained material readiness of systems
- IV. Technology Development: Enable the inclusion of new technology initiatives into the tech data system
Implementation of S1000D

- New and Modified Weapon Systems
- Legacy Data
- Understanding End-User Needs
- Service Boundary Conditions
- Achieve Network Centric Logistics
- Sustainment of Data Systems
- Digital Technical Data Capability

Tasking for Maturing S1000D

Service / Industry / International Teams

- Complete Business Rules
- Identify Needs
- Identify Pilot to move toward Network Center Operations

TASKING

Missions
– RWCAS
– Convoy Escort
– Utility Support
– Armed Recce
– CASEVAC
– Airfield QRF

24 / 7 Sustained operations

Average % Day/Night – AH: 58.6 / 41.4 – UH: 60.6 / 39.4

FMC / MC (%) – AH: 61.0 / 70.7 – UH: 55.0 / 60.0

"These old aircraft are surviving and succeeding on the backs of our maintenance Marines and at the risk of our aircrews lives."



Defense Acquisition Policy Working Group

The DoD Acquisition Guidebook 12 June 2003

DoD Acquisition Guidebook

Objective

- Revise and Complete Electronic DoD Acquisition Guidebook by September 2004
- Electronically Link the Guidebook to Policy Documents (DAU)

<u>Criteria</u>

- This will be a Guide NOT A POLICY Document !!
- Explain, will not require
 - What and how vice shall and will
- Except when...(driven by 5000 policy)
- Relationship to other Guides and other Chapters

Overview of the Defense Acquisition Guidebook (11 Chapters)

- <u>Chapter 1, Department of Defense Decision Support Systems</u>, an overview of the Defense Department's decision support systems.
- <u>Chapter 2, Defense Acquisition Program Goals and Strategy</u>, acquisition program goals and the topics the program manager should consider in developing a strategy for the acquisition program.
- <u>Chapter 3, Affordability and Life-Cycle Resource Estimates</u>, acquisition program affordability and resource estimation.
- <u>Chapter 4, Systems Engineering and Integrated System Design</u>, system design, and the systems engineering processes that aid the program manager in designing an integrated system to balance capability,
- <u>Chapter 5, *Life-Cycle Logistics*</u>, provides the program manager with a description of Life-Cycle Logistics and its application throughout the system life cycle, from concept to disposal.

Chapters 4 & 5 are strongly linked

Overview of the Defense Acquisition Guidebook (Chapters 6-11)

- <u>Chapter 6, *Human Systems Integration*</u>, addresses the human systems elements of the systems engineering process.
- <u>Chapter 7, Networks and Information Integration</u>, network-centric strategy to transform DoD warfighting, and intelligence capabilities.
- <u>Chapter 8, Intelligence, Counterintelligence, and Security Support</u>, responsibilities regarding the prevention of inadvertent technology transfer, and guidance for the protection of those technologies.
- <u>Chapter 9, *Integrated Test and Evaluation*</u>, integrated test and evaluation strategy to assess operational effectiveness and suitability.
- <u>Chapter 10, Decisions, Assessments, and Periodic Reporting</u>, program manager and Milestone Decision Authority oversight responsibilities.
- <u>Chapter 11, *Program Management Activities*</u>, activities and decisions required of the program manager, not discussed in earlier chapters.

5000 Guidebook Overview

- Acquisition professionals should use this Guidebook to perform their management responsibilities.
- Each chapter is designed to improve understanding of the acquisition process and ensure knowledge of the statutory and regulatory requirements associated with the process.
- The Guidebook is more an electronic reference system than a "book".
- Hyperlinks let you electronically jump to related info.
- Some links take you to external references, such as United States Code, or other formal DoD publications.

http://AKSS.DAU.MIL/DAG/

Total Life Cycle Systems Management (TLCSM) [5.1.1]



Under TLCSM the PM is responsible for Life Cycle Logistics (LCL), emphasizing LCL in systems engineering and implementing product support through Performance Based Logistics (PBL).

Discussion Topics

- How can we accelerate adoption of international standards to support net-centric operations and logistics?
- What is the appropriate role for industry and professional societies in standards adoption?
- Are current standards efforts sufficient to achieve net-centric operations and life cycle management?
- How can we better synchronize standards efforts with Allies?

Will application of S1000D help DoD achieve Net Centric Focused logistics? Are there other alternatives?



- Government and Industry must work together to achieve this objective
 - Framework has been established
 - Performance based products
 - Challenge to implement, must be cost effective
 - Change is hard, but we owe it to the Warfighters to succeed

Meeting Warfighter needs Around the Clock, Around the Globe.

Potential Tech Data Solution Set



Potential Tech Data Solution Set



Affordable

Where is CM and DM in DODD 5000.1

Presented 2-4 March 2005 Dr. Jay Billings





What is Dodd 5000.1

- The Federal Government uses a "gated decision" or milestone approach to management of large acquisitions
 - OMB Circular A-109
 - DoDD 5000.1
- Key elements are
 - Single point of authority and responsibility
 - Decisions made at major life cycle milestones
 - There are **technical** and **budgetary** milestones
 - Technical = feasible
 - Budgetary = affordable



What is the overall DODD Life Cycle Management Approach?

 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.

Overall View



Full Spectrum Analysis

W^4HMode

What

Threat Capability gaps Present Projected future Technology application

Specific core deficiencies, problem areas, or opportunities stated as single issues

Doctrine Strategy Policy **Goals & Objectives** Plans & Procedures Organization **Ownership of Assets Decision Authority** Command relationships Material Comm. interfaces Training Competencies Knowledge Skills Abilities New schools Process **Personnel**. Facilities Support Needs

Who

Organization setting. Which organizations interface with the system? Address interfaces with other Joint Systems. Who will use the system when it is developed and fielded?

When

Programmatic Milestones Time frames Deadlines Deliverable dates FOS Synchronization P³I Time phasing Spiral acquisition Spiral development Operational Phases of campaign

IOC Deployment process

Time frames that will support acquisition approach. Milestones and.or dates to be delivered and fielded. Also consider phases of campaign Place on the battlefield Mobility Accessibility Survivability **Physical Environment** Facilities Terrain Weather & climate **Theater specific** considerations Supplies Transportation Deployment Installation Network Maintenance Civil considerations

Where

The system's place on the future battlefield. Consider physical environment. How

Doctrine

TTP **OPLANS** Military conditions ROE Leadership **Decision Support** Information Mgmt Deployment Material Network Design Implementation **FOS** Integration Performance Personnel Performance

Employment operation. How will the system be used to attain present and current future military objectives? Consider conditions under which the system will be used.

JCIDS Analysis



Functional Capabilities Boards

Responsibilities

- Ensure new capabilities are conceived and developed in joint warfighting context
- Ensure JCIDS proposals are consistent with integrated joint force
- Validate Joint Impact proposals
- Organize, analyze & prioritize capabilities proposals
- Oversee development and update of Functional Concept(s)
- Ensure integrated architectures (as available) reflect functional area

Status

- 5 Chartered by JROC:
 - Command & Control (JFCOM);
 - Battlespace Awareness (J2);
 - Force Application (J8);
 - Focused Logistics (J4)
 - Protection (J8)

More Efficient Use of Scarce Department Resources

JCIDS Documents

- Capability Development Document (CDD)
 - Replaces ORD at Milestone B
 - Identifies operational performance attributes of proposed system
 - System specific, applies to single increment (in an evolutionary program)
 - Results from Technology Development and supports Milestone B
- Initial Capabilities Document (ICD)
 - Replaces MNS
 - Identifies a capability gap or other deficiency
 - Describes evaluation of DOTMLPF approaches
 - Support Analysis of Alternatives (AoA), Concept Refinement and Milestone A
 - Not updated once approved
- Updated or rewritten for subsequent increments

JCIDS Documents (cont'd)

- Capability Production Document (CPD)
 - Replaces ORD at Milestone C and FRPDR
 - Identifies production attributes for a single increment of a program
 - Prepared during System Development and Demonstration
 - Rewritten for each increment in an evolutionary program
- Capstone Requirements Document (CRD)
 - No Near Term Change
 - Describes overarching thresholds/goals and standards in functional areas
 - Useful for family-of-systems or system-of-systems approaches
 - Developed only at JROC direction
 - Eventually will be replaced by integrated architectures

Increased Flexibility

- PM determines what information is required to satisfy regulatory requirements
- MDA may tailor (with some exceptions) regulatory information requirements
- MDA resolves issues regarding Guidebook expectations

The Opportunity to Be Innovative







- Time-Phased Requirements
- A Modular Open Systems Approach to facilitate Technology Insertion
- Evolutionary Sustainment Strategies
- T&E Consistent with Evolutionary Approach
- Full Funding

System Development & Demonstration



System Integration

Enter: PM has technical solution but has not integrated subsystems into complete system; approved CDD

Activities:

- System Integration of demonstrated subsystems and components
- Reduction of integration risk
- DT/EOA/preliminary LFT&E
- Exit: Demonstration of prototypes in relevant environment

System Demonstration

Enter: Prototypes demonstrated in intended environment

Activities:

- Complete system demonstration
- DT/OA/OT and preliminary LFT&E
- Exit: System demonstration in intended environment using engineering development models; meets validated requirements

Each EA Increment Must Have...



Milestone B & C

- Capabilities Development & Production Document (CDD/CPD)
- Performance, Cost and Schedule Goals (Acquisition Program Baseline)
- Operational and Live Fire Testing (If Required)
- Compliance with Acquisition Oversight Requirements
 - Acquisition Strategy that reflects consideration of:
 - Logistics Planning;
 - Manpower, Personnel and Training;
 - Environmental and Security Factors;
 - Protection of Critical Program Information;
 - Spectrum Management
 - Other information tailored to the conditions of the program

Increments are Related, but Separate Acquisitions





Where do CM and DM appear?





The DoDD described system Conflicts with Easy CM/DM

- Time-Phased Requirements
- A Modular Open Systems Approach to facilitate Technology Insertion
- Evolutionary Sustainment Strategies
- T&E Consistent with Evolutionary Approach
- Full Funding

- INSIDE CHANGE
- INSIDE CHANGE

- INSIDE CHANGE
- OUTSIDE CHANGE
- NEVER HAPPENS



 DoD 4120.24-M, the Defense Standardization Program (DSP)

Policies and Procedures, there are only two classes of standards and specifications to be considered: those that may be used with no restrictions and those documents requiring waiver prior to application.

 Defense Standardization Program Policies and Procedures Paragraph C3.8.2. of DoD 4120.24-M lists nine types of documents that may be used in development contracts. Of particular interest are three military document types: standard practices, interface standards, and defense standards.



CM and DM are in Dodd 5000.1, but are subsets of other Systems Management Topics

- Technical Management
- Risk Management
- Interface Management



Standards

- ANSI/EIA 649A, Configuration Management, on the <u>GEIA website</u> (Click on STANDARDS);
- ISO 10007, Quality Management Guidelines for Configuration Management;
- EIA 836, Configuration Management Data Exchange and Interoperability, located on the <u>GEIA website</u> (Click on STANDARDS); and
- <u>MIL-HDBK-61A</u>, Military Handbook, Configuration Management Guidance



- ISO/IEC 15288, Systems Engineering-System Life Cycle Processes
- ANSI/EIA 632, *Processes for Engineering a System*
- IEEE 1220, Application and Management of the Systems Engineering Process
- EIA 731, Systems Engineering Capability Model
- CMMI SWE/SE/IPPD/SS, Capability Maturity Model-Integration for Software Engineering, Systems Engineering, Integrated Product and Process Development and Supplier Sourcing



- 4.6.2.Handbooks and Guides
- Guidance for the Use of Robust Engineering in Air Force Acquisition Programs
- Navy Systems Engineering Guide
- INCOSE Handbook
- <u>MIL-HDB-61</u>, Configuration Management
- MIL-HDBK 881, Work Breakdown Structure
- MIL-HDBK 1785, Systems Security Engineering
- NASA SE Handbook
- DSMC Systems Engineering Fundamentals
- DAU Risk Management Handbook
- Product Support for the 21st Century: A Program Manager's Guide to Buying Performance
- <u>Designing and Assessing Supportability in DoD Weapon Systems: A Guide to Increased Reliability</u> and Reduced Logistics Footprint
- DoD Template for Application of Total Life Cycle Systems Management (TLCSM) and Performance Based Logistics (PBL) In the Weapon System Life Cycle
- DoD Guide for Uniquely Identifying Items
- The Reliability Analysis Center is a DoD Information Analysis Center, a Center of Excellence, and a technical focal point for information, data, analysis, training and technical assistance in the engineering fields of Reliability, Maintainability, Supportability, and Quality. Their web site is http://rac.alionscience.com/
- ISO/IEC TR 19760, Systems Engineering A guide for the application of ISO/IEC 15288 (System Life Cycle Processes), First Edition, 2003-11-15



SYSTEMS PLACES where Standards CM and DM should be found CORPORATION

- Acquisition Strategy
- Product Support Strategy
- Statutory, Policy and Guidance Factors
- Acquisition Program Baseline
- Test Evaluation Master Plan
- WBS


Places where Standards and CM and DM should be found

- DoD 5000.1 and DoDI 5000.2 may not mention CM and DM specifically, but they do require several documents that allow for the application of CM and DM.
- This application is subject to tailoring and may be deleted, or incorrectly included. (c)2005 Defense Sytstems Management Corporation



- Why should we include CM and DM in DoD major acquisitions?
 - Makes sense to do it
 - They are fundamental management tools for systems management and for engineering management.
- Why exclude CM and DM from DoD major acquisitions?



- Why exclude?
 - They are alleged to "cost money"
 - They cause system to lose flexibility by forcing discipline too early
 - They do not allow for quick changes to reflect
 - mission changes
 - requirements changes
 - technology changes
 - they show responsibility and support accountability.



- Why include?
 - Increases knowledge
 - Avoids restarts and duplicative efforts
 - Assigns responsibility and accountability



- Where it can be used
 - Analysis of alternatives (Chapter 3 DoDI 5000.2)
 - System Engineering Plan (Chapter 4 DoDI 5000.2
 - Test and Evaluation Master Plan (Chapter 9 DoDI 5000.2)



Why CM and DM

- How can CM and DM be "sold"?
- One must describe the
 - Features--
 - Benefits--
 - Proof



- <u>S1000D International Specification for Technical Publications</u> <u>Utilizing a Common Source Database</u>;
- <u>Data Management Community of Practice (CoP)</u>, located on the Acquisition Community Connection on the DAU website;
- <u>DoD 5010.12-M</u>, Procedures for the Acquisition and Management of Technical Data, May 1993;
- <u>DoD 5200.1-M</u> Acquisition System Protection Program, March 1994;
- GEIA-859, Consensus Standard for Data Management, located on the <u>GEIA website</u> (Click on STANDARDS). (Note: This document is currently being published.);
- Intellectual Property: Navigating Through Commercial Waters, October 15, 2001,
- ISO 10303, Standard for the Exchange of Product Model Data (STEP), website



- The applied systems engineering process requires *access* to data to facilitate decision making, but does not necessarily require *acquisition* of *all* data. The data management processes assist in decision-making. Data management processes reveal the proper data to be acquired or accessed. The decision to purchase data should be made when access to required data is not sufficient to provide for Life-cycle planning and system maintenance. The cost of data delivery should be a primary consideration. Other considerations include the following:
- Data requirements for spare and repair parts;
- Technical data needed for ordering and purchasing items for contingencies; and
- Circumstances under which the data may evolve over time to more useful or updated data.



• 4.2.3.7.3.Data Storage The program manager also has responsibility for addressing long-term storage and retrieval of data and associated program information - planning for digitizing continued need information, as appropriate and cost-effective. Such long-term planning and incremental digitization, as required, will assure that applicable data is available, preserved, and migrated to successive formats for future planning and use.



- Key Logistics activities that must be completed before MS B:
- Preparation and/or assessment of sustainment planning and parameters in the
- Capabilities Development Document (CDD)
- Description of the product support strategy as documented in the Acquisition
- Strategy (ASR)
- Description of the appropriate logistics metrics, criteria, and funding
- requirements in the Acquisition Program Baseline (APB).
- Description of the appropriate logistics considerations and test points in the Test
- and Evaluation Master Plan (TEMP)



- The following LCL 'drivers' should be considered in the Initial Capabilities Document :
- System Maintenance/Support Profiles and Use Case Scenarios (Support Capability Packages)
- Reliability and Maintenance Rates
- Support Environment and Locations for Support
- Support and Maintenance Effectiveness
- Duration of Support



Cost Analysis

- Lifecycle Cost Methodology
- Models and Data
- Cost Sensitivity and/or Risk Analysis
- Cost-Effectiveness Comparisons
 - Cost-Effectiveness Methodology
 - Displays or Presentation Formats
 - Criteria for Screening Alternatives

Organization and Management

- Study Team/Organization
- AoA Review Process
- Schedule



Case 1: Requirements What are the major CM and DM issues for a requirement for "germ/virus resistant clothing"

- CM
- 1
- 2
- 3
- DM
- 12
- 3



What should be in your proposal for the Germ/Virus Resistant Clothing?

- CM
- 1
- 2
- 3
- DM
- 1
- 2
- 3



What are good metrics to show that CM and DM is being used on a DoD

Project/Program?

CDM Certification and Apprentice Tutorial



STRENGTH THROUGH INDUSTRY & TECHNOLOGY



CDM Certification and Apprentice Tutorial Introduction

- CDM Certification Background
- Milestones
- The NDIA Process
- Other NDIA Certification Activities
- NDIA Program Strengths
- Recertification Program
- Conclusions Questions?

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CDM Certification and Apprentice Tutorial Background

- Certification initiated in 1990 by ADPA (the predecessor association to NDIA)
- Modeled after successful certification programs in medical professions, and other disciplines such as logistics, quality, contract management, etc.
- Common aspect among all <u>viable</u> programs is their insistence that high levels of professional competence result from two sources:

Knowledge and Experience

CDM Certification and Apprentice Tutorial Background (Cont'd)

 Knowledge can be gained in several ways; formal education, seminars, self study, job assignments, on-the-job training, etc.

HOWEVER

<u>Experience</u> can <u>only</u> be gained by actual performance

CDM Certification and Apprentice Tutorial Background (Cont'd)

This is why recognized and respected certification programs in any discipline require individuals to demonstrate their knowledge, and possess the needed experience to become certified. For example, to become board certified as a surgeon one must have performed successful surgery of the specified type for the required number of times; and separately demonstrate their knowledge.

CDM Certification and Apprentice Tutorial Milestones

- ♦1990: ADPA sponsors Technical Information Division CM and DM certification
- ♦ 1990: Limited 'Grandfather' CM and DM Certification initiated, <u>based on experience</u>
- 1991 1995: Certification <u>by examination</u> offered separately in CM and DM disciplines at Manager and Specialist levels; exams <u>based primarily on DoD methodology</u>

CDM Certification and Apprentice Tutorial Milestones (Cont'd)

- 1996: Separate CM and DM Certifications combined into one <u>CDM Certification</u>
- 1996 on: <u>Exams based on prevalent Industry</u>, <u>International and government standards</u>; Exams modified to emphasize essay questions in addition to objective questions
- ♦ 1997: ADPA/NSIA merge to become NDIA
- 2000: NDIA International CDM Certification initiated with first exams in United Kingdom

CDM Certification and Apprentice Tutorial

NDIA Process

 NDIA Certification requires that applicants meet the following requirements:
 (1) Pay fee; (2) Submit CDM experience resume; and (3) Demonstrate CDM knowledge on exam

 This process requires <u>significant effort</u> by the candidate

 Examination is not difficult, <u>but; the CDM</u> <u>discipline is broad</u>, and candidates need to prepare and apply themselves

CDM Certification and Apprentice Tutorial

 Following charts focus on CDM Certification; but also apply to the CDM Apprentice program

 The significant difference is that the Apprentice only requires a minimum level of experience
 The Apprentice exam is much easier even though the subject matter is the same

2005 Fee Structure

• Examination fee: \$250.00

 <u>Required</u> one year NDIA individual membership: \$30.00

Examination <u>retake fee</u> (if needed):
 \$100.00 (Valid for 24 months from date of first exam)

CDM Certification and Apprentice Tutorial NDIA Process Provide CDM Experience Resume

• Requirements:

Apprentice:about 1 Year CDM ExperienceSpecialist Certification:5 Years CDM ExperienceManager Certification:10 Years CDM Experience

 Applicants document in a resume their combined CM and DM activities during various work assignments

 Resume reviewed, and verified (as appropriate) by two Technical Information Division certified board members

Demonstrating Knowledge: The Examination

- Basic philosophy: examination attempts to determine an individual's knowledge, <u>Not</u> their ability to memorize references
- Includes questions on hardware, software and many data management subjects
- Administered in four parts, each with defined subject matter
- Questions in essay and objective formats

Demonstrating Knowledge: The Examination

- Exam envelope: 8:00 AM to 4:30 PM, with between parts and lunch breaks
- No reference materials may be used
- Administered only by TID Certified board members who are responsible for security and integrity of the examination
 Passing score: 70% (achieve 280 of the maximum 400 points)

Demonstrating Knowledge: The Examination

- Scoring performed by volunteer Scoring Teams (6 or more NDIA certified individuals)
- Team has complete scoring authority, including the ability to 'throw-out' questions judged inappropriate or invalid
- Objective questions: Scored using the TID consensus scoring key
- Essay questions: Scored independently and subjectively by three team members with final score assigned by team lead

CDM Certification and Apprentice Tutorial NDIA Process The Certification Award

- Certifications are signed by NDIA
 Director of Operations, TID Chair, and
 TID Certification Section Chair
- NDIA Director of Operations congratulatory letter accompanies each certification
- Name of each person certified annually printed in National Defense magazine
- Name of all certified individuals entered in the 'Book of Honor' at NDIA HQ

CDM Certification and **Apprentice Tutorial Other Certification Activities Certification/Apprentice Preparation Course** A preparation course is presented annually at various conferences (GEIA, ACDM) Course also presented upon request by companies or groups of individuals Provided by NDIA because many applicants report their organization has no training designed to help prepare the staff for Certification or Apprentice

CDM Certification and Apprentice Tutorial Other Activities

Promoting the NDIA CDM Certification and Apprentice Programs

 Publication of promotional documents Advertising in selected publications
 Certification and Apprentice Study Guides
 Examination schedules
 Briefing organizations and companies interested in the program

CDM Certification and Apprentice Tutorial Program Strengths

- NDIA Certification is widely recognized as the industry leader; and is the single CDM certification adhering to high standards maintained by other successful programs (i.e. maintaining the requirement that candidates <u>must</u>):
 - Meet established experience levels
 - Successfully Demonstrate CDM knowledge by passing the examination

CDM Certification and Apprentice Tutorial <u>Program Strengths (Cont'd)</u>

Because of these standards;

- those who earn NDIA Certified Configuration and Data Manager (CCDM) or NDIA Certified Configuration and Data Specialist (CCDS) are recognized as <u>professionals</u> within the discipline.
- Those who earn NDIA CDM Apprentice level are recognized as serious individuals on their way toward CDM professional status when they have required experience to apply for Certification

CDM Certification and Apprentice Tutorial <u>Program Strengths (Cont'd)</u>

- NDIA Certification has been developed over time by hundreds of experienced and respected CDM professionals, many of whom continue to provide guidance and support
- The examination always reflects current trends in CDM, and is based on the most prevalently used <u>industry, international, and government</u> guidance documents

CDM Certification and Apprentice Tutorial <u>Program Strengths (Cont'd)</u>

- Examination focus is on practical, real world CDM subjects using both objective and essay type questions
- No reference document memorization is needed (or recommended)
- Many exam questions may be successfully addressed based on an individual's CDM experience
CDM Certification and Apprentice Tutorial Recertification Program

 A 'Re-certification' program was initiated in January 2003; it provides a method to be <u>recertified</u> five years after the original certification, for the following reasons:

Rapidly changing CDM applications and guidance stds. require <u>current knowledge</u>

To enhance the quality of CDM participants by eliminating those who have chosen to leave active participation in the discipline

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CDM Certification and Apprentice Tutorial Re-Certification Program (Cont'd) • Re-certification may be applied for and accomplished by: • (1) Retaking the examination or

- (2) Documenting the following:
 - Completing recognized CDM training courses
 - Conducting CDM training courses
 - Continuing activity in a CDM job
 - Participation in conferences with CDM focus

CDM Certification and Apprentice Tutorial Re-Certification Program (Cont'd)

- TID board members review and evaluate applications and submitted documentation
- Upon approval, a re-certification is issued valid for an additional five years
- There is an NDIA fee of \$200.00, if membership is current
- Those choosing not to be re-certified still retain their prior certification; <u>however</u>, it is considered a "<u>non-current</u>" certification

CDM Certification and Apprentice Tutorial Recertification Program (Cont'd)

 All NDIA certifications issued subsequent to 1 January 2003 have expiration dates five years from date of issue (date of exam)

 Complete information is at: ndia.org (see Recertification Plan)

or contact Dick Thomas or any TID Board Member

NDIA Certification/Apprentice Program Conclusions

Program success has surpassed expectations and resulted in the following:

- As of 1 January 2005, over 1500 CDM professionals have earned NDIA Certification, and 29 have earned NDIA CDM Apprentice status
- These NDIA Certified individuals provide a quality base within the discipline that <u>enhances the CDM professional environment</u> for all practitioners

NDIA

21st Annual National Logistics Conference

Adapting Logistics Capabilities to National Security Requirements

Industry Keynote LTG Peter Cuviello, USA (Ret.) Vice President and Managing Director Lockheed Martin Focused Logistics Enterprise

1 March 2005

Agenda

- A Walk through History
- What we can learn from the past
- Thoughts on logistics transformation

- From the Greek word "logistikos" – meaning "skilled in calculating"
- •Originally used in Roman and Byzantine times when there was a military administrative official with the title "Logists".
- •The word implied a skill in the sciences of mathematical computations.

When US Logistics Started

- By resolution in 1775 the Continental Congress provided for a staff to administer aspects of its military establishment. On 16 June legislation was passed authorizing an Adjutant General, a Commissary General of Stores and Provisions, Quartermaster General, among others
- The First TRANSCOM: The greatest responsibility of the quartermaster general was to provide transportation but also had other duties related to the procurement and distribution of supplies



The beginning of the Defense Industrial Base

- 1639 ~ manufacture of gunpowder
 - Massachusetts Bay colony
- 1647 ~ Cannon cast in Lynn, Mass
 and Bridgewater, Conn in 1648
- 1680 ~ powder mill at Dorchester



- After British prohibited in 1774 the export of firearms to the colonies, Massachusetts established a public arms factory.
 - Virginia established a plant at Rappahonnock Forge near Fredericksburg
 - 1775, Pennsylvania established a gunlock factory in Philadelphia. In the winter of 1775-76 Pennsylvania arms makers manufactured more than 4,000 muskets.

Historical Perspective, War of 1812



The Defense Industrial Base Grows with both Public Arsenels and Private Industry

- 1812, Eli Whitney accepts contract for the manufacture of muskets in Conn and New York but wanted a 20 year period to amortize the cost of tooling that was necessary to improve reliability
- Production of muskets at the national armories increased steadily from 1808 to 1812, at Springfield and Harper's Ferry
- 1840-1850s ~ defense contracting evolves

Defense Industrial Base continues to grow with a number of Private Industry suppliers providing rifles, pistols and swords.

Because the US Government is virtually the only customer the practice of renewable long term contracts is successfully implemented for those providers of quality products offered at competitive prices. ~ Whitney of Conn.; Pomeroy of Pittsfield Mass; Derringer of Phila.

Revolution. General Washington continually handicapped by lack of munitions, supplies and transportation. The situation was improved by aid from France

Civil War. The Confederate army was hindered and never succeeded in overcoming its supply deficiencies even with some small arms and fabric from the UK and support from France late in the war.

WW I. The US Army could not have played the decisive role without weapons, munitions, supplies and transportation furnished by allies.

OIF. US forces were reliant on coalition and friendly allied support for water, fruits and vegetables and batteries, among other things.

LOGISTICS and Warfighting



Equivalence

Strategy



Tactics

Historical Perspective, Revolutionary War

- Burgoyne's Surrender at Saratoga.
 - Breakdown of his transportation
 - Failure of procurement in Canada
 - Failure of procurement en route
 - Delays that gave the Americans time to reorganize



- What Borgoyne considered essential in numbers of men and artillery and baggage proved to be only a burden against success.
- In moving heavy ordinance and stores he lost one of the most important elements in warfare - timing
- For the Americans, lines of communication remained open, resupply generally was adequate, and troops were sufficiently well re-equipped



1st Manassas: If Confederate forces had logistics support they could have pursued Federal Forces all the way to Washington.

Peninsular Campaign, Spring 1862, McClellan moved 110,000 men and supplies employing 400 steamers and sailing vessels, 14,500 animals and 44 batteries of artillery.

Antietam: Logistics provides an opportunity, not exploited ~ because of an extraordinary use of the railroads for resupply, McClellan was provided the means to renew the attack and gain a decisive victory over Lee's forces. In Sept 1862, it could have been over.

Gettysburg: The Union Victory at Gettysburg can be ascribed to an immense logistical advantage through use of railroads to bring up supplies and men to General Meade. The federal side had enough supplies to continue the battle for days. Even without the Confederate's "tactical errors" they could not have been able to sustain the campaign for a decisive victory over the Union Army.





Quote from the Army Chief of Military History about the North Africa and Mediterranean Campaign in 1942

"A situation as shocking to the War Department as it was embarrassing to the Services of Supply in the European theater developed when it became necessary to reorder large quantities of Class II {clothing and weapons} and IV {construction and fortification} supplies that were knowns to be already in the United Kingdom but which, because of faulty marking and lack of proper records, could not be found in time to equip the forces preparing to sail from Britain.

It hardly helped matters when requisitions arrived without proper identification and when timely status of supply reports were lacking."



The Classical Principles of Logistics Continue to Apply

- First with the most
- Equivalence
- Materiel Precedence
- Economy
- Flexibility and Dispersion
- Feasibility
- Timing
- Unity of Command
- Knowledge through Information

"A backlog of hundreds of pallets and containers of materiel at various distribution points due to transportation constraints and inadequate asset visibility."

"A discrepancy of \$1.2 billion between the amount of materiel shipped to Army activities in the theater of operations and the amount of materiel that those activities acknowledged they received."

"A potential cost to DOD of millions of dollars for late fees on leased containers or replacement of DOD-owned containers due to distribution backlogs or losses."

"The cannibalization of vehicles and potential reduction of equipment readiness due to the unavailability of parts that either were not in DOD's inventory or could not be located because of inadequate asset visibility."

4

"The duplication of many requisitions and circumvention of the supply system as a result of inadequate asset visibility."

The accumulation at the theater distribution center in Kuwait of hundreds of pallets, containers, and boxes of excess supplies and equipment that were shipped from units redeploying from Iraq without required content descriptions and shipping documentation.

"DOD did not have adequate visibility over all equipment and supplies transported to, within, and from the theater of operations in support of OIF."

"DOD did not have a sufficient distribution capability in the theater to effectively manage and transport the large amount of supplies and equipment deployed during OIF."

4

"The failure to effectively apply lessons learned from Operations Desert Shield and Desert Storm and other military operations may have contributed to the logistics support problems encountered during OIF."

"At times there were shortages of some spares or repair parts needed by deployed forces.

"Army pre-positioned equipment used for OIF was not adequately configured to match unit needs.



"DOD contractors used for logistics support during OIF were not always effective.

"Physical security at ports and other distribution points in the theater was not always adequate to protect assets from being lost or taken by unauthorized personnel.

For Logistics the Battle is the Pay-off.

Beyond the procurement of military supplies and equipment there remain the closely related activities of storage, distribution and transportation to get materiel into the hands of the troops and to all the battle areas*

*The Sinews of War, Army Logistics 1775-1953, Office of the Chief of Military History, United States Army

The most elegant element of logistics transformation is the design of logistics solutions into the weapon system itself

- Designing systems for maintenance free operation
- Use of autonomic solutions employing prognostics and health management
- Different ways of thinking about managing obsolescence through technology refresh strategies
- Performance Based Logistics Business strategies, for system level total sustainment, where long term contracts and tailored incentives force lean principles and continuous improvement in system level availability and TOC reduction

Concluding Comments

* Elegance of engineering solutions
* Courage to employ new business models
* Integration of logistics into the overall command and control so that we truly achieve equivalence as the classical principle states:

Strategy, tactics and logistics, as history has proven, is what wins wars.

A Historical Perspective to Drive the Future

"The line between disorder and order lies in logistics..."

...Sun Tzu

"My logisticians are a humorless lot ... they know if my campaign fails, they are the first ones I will slay."

...Alexander

"There is nothing more common than to find considerations of supply affecting the strategic lines of a campaign and a war."

... Carl von Clausevitz

"Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics brings the troops to this point."

...Jomini: Precis de l'Art de la Guerre. (1838)

"Gentlemen, the officer who doesn't know his communications and supply as well as his tactics is totally useless."

...Gen. George S. Patton, USA

"The war has been variously termed a war of production and a war of machines. Whatever else it is, so far as the United States is concerned, it is a war of logistics."

... Fleet ADM Ernest J. King, in a 1946 report to the Secretary of the Navy

"Bitter experience in war has taught the maxim that the art of war is the art of the logistically feasible."

...ADM Hyman Rickover, USN

"Forget logistics, you lose."

...Lt. Gen. Fredrick Franks, USA, 7th Corps Commander, Desert Storm

LOCKHEED MARTIN

NPIA Technical Information Division Symposium

Integration of Systems Engineering & Supportability

March 2005

Joe Grosson Executive Director, Focused Logistics Enterprise & Corp. Director of Logistics

Overview of the LM Sustainment Business Base

C2 of DoD **Distribution & Transportation**

Delivery of Wayfighter Capability ~ Present, LM Business Base (\$6B+)

Control of Warfighter Capability Logistics Command & Control e.g. GCSS, GTN, AF Knowledge System, AF NIPRNET/SIPRNET Portal, ILS-S, FIRST, Maint.Training, ERP Study, Navy Log EA,

C4ISR

COCOM

AF Enterprise COTS Integration, C2 Constellation, MARCOR AL

DOD Enterprise System Implementation e.g. DLA BSM, JEDMICS, DMS, JLACTD

Performance Based Logistics, Prime Vendor, TSSR, SCM, System Support and Maintenance

LMŚI

<u>MS2</u> •MK 41 •AEGIS ARCI •A/C Tires Trident Nav •Q70 CDVD BSY-2 POSS Va.Class NPES

•F-14 LANTIRN Apache TADS/PVNS ALC <u>STS</u> •CASS

M&FC

•MEP

•HIMARS

•JAVELIN

•A/C Maint./Repair Aviation SCM

<u>Aero</u> •H-60 TTT •JSF •F-16 •H-60 Avionics •F-117 TSPR •Merlin LMSM Log. Support Services •WIN T Log ISS

> AF OSI Maintenance USMC Auto Log

•THAAD TRIDENT MSL

Space

New Acq. Prog. **Pursuits** •**MMA** •LCS

•MUOS

Total systems support from design to disposal (D2D)

Supply Support

- Depot Management
- Requisition Processing
- Supply Chain Management
- Transportation & Distribution
- Stock Point Functions
- Modeling and Forecasting
- Repair & Return

Supportability Engineering

- Technology Refresh & Insertion
- Configuration Management
- Baseline Mgmt. Functional, Physical
- Design for Supportability
- Safety Engineering.
- Test Planning
- Test, Validation & Verification of Technology Refresh/Insertion
- Software Maintenance
- Hardware Maintenance
- Commonality Analysis

•Systems Design
 •Systems Engineering
 •Systems Integration
 •Software Development
 •Production
 •Enterprise Resource Planning

Single Point Accountability

Program Management

- Strategic planning
- System Upgrade & Major Maintenance Schedules
- Cost Baselines
- Ownership Cost Reduction
- Contracting Services for:
 - Maintenance
 - Support services
 - Upgrades
 - Major System Overhaul
- Schedule Baselines
- Technology Insertion
- **Development Schedules**
- Subsystem Upgrade
- Schedules

Installation & Maintenance

- Remote Condition Monitoring
- Work order generation
- Fault response monitoring
- Installed base maintenance (RCM, CBM)
- Documentation Updates
- System Grooming
- Distance Support to Field Operators & Maintainers
- Asset data collection
 Data base maintenance
- Data base maintenanc

Training

- New Operators & Maintainers
- Workforce
 - Management
 - •Technical
 - Operational
 - Compliance
- Refresher and Update training
- Curriculum Updates

End State: Integration of Systems Engineering & Supportability For the life of the system



In the Trade-Space Domain, ALL Elements are Mutually Inclusive

Maintenance Free Operating Period (MFOP) -Wedge of Opportunity

•MFOP - Eliminates maintenance and the need for associated support while aligning logistics actions with preplanned COTS Technology Refresh and Insertion for improved Operational Availability.



Cumulative Life-Cycle Costs Incurred by the Program/System

Design to Disposal™ Intelligent Logistics Architecture ~ Functional Flow



Autonomous & Intelligent Design to Disposal Management & Control of Maintenance, Engineering, CM, Training, Field & Distance Support, Supplier/Repair, Warehouse, Inventory, Transportation, PHM, Government Interfaces & Portals



Technology Migrations



Systems Integration: 6 - Major Elements to Systems Integration



Systems Integration: Managing Operational Effectiveness



- Focus on Mission Success and the Impacts of Multi-Platform Operations
- Transition from Operational Shortfall to Performance Requirements
 - Involve End-User in Defining System
 Performance Requirements
- Push Advanced Technologies to the Fleet
- Assess What is Achievable at an Affordable Cost & Acceptable Risk

Systems Integration: System Architecture



- System/Subsystem Interface Requirements
 - Identifying Standards and Their Migration
 - Maintaining an Open Architecture to Facilitate Future Enhancements
- Leverage State-Of-The-Practice Technologies and Standards for Military Use
- Determine Impacts to Currently Fielded Platforms/Systems
- Develop Implementation Schedules that Optimizes LCC
- Assess Architectures from a
 Supportability Perspective

Systems Integration: Cost Analysis



- Integrate LCC into the System Engineering Process
 - System Engineering "Trade-Space" Must Be Constrained By Cost
- Understand the Drivers
 - Internal/External Infrastructure
 - Improved Performance
 - Technology Obsolescence
 - Support/Maintenance/Manpower
- Focus on Total Ownership Cost Not Just Development and Acquisition
 - Fleet Support
 - Training
 - Contractor Infrastructure Costs
 - Sub-Tier Competition
Systems Integration: Supportability Engineering and Logistics Planning



Supply Support

- Spares Management/Optimization
- IT Leverage to Supply Chain Management
- Physical Commonality
- Coordinate Technology Refresh with Spares Requirements
- COTS Maintenance Agreements
- Training and Trainers
 - Operational Commonality to Reduce Skill Level Requirements
 - Embedded, Portable, Adaptable, Distance Training
 - Multi-Media Leverage to Training
- Platform/System Documentation Requirements
 - Multi-Media Leverage to Documentation
- Facilities
 - Prototype Laboratory
 - Total Asset Visibility/CM

Systems Integration: Supportability and Logistics

Skills, Facilities

SISAIEUV

1500

Supportability/ Logistics

Teamwork

Archifecture

Waishs

Integration Systems

Operational Assessment

Supportability

Better Integration of Supportability Engineering into Design

Innovative Quantifiable Metrics **Innovative Models and Best Practices Integrated Design/Data Environment**

Network Centric Logistics Planning Maintenance Concept/Infrastructure **Logistics Information Management Proactive Demand Forecasting and Responding to Logistics** Requirements

Logistics

System Integration:

The Total Sustainment Approach - Benefits



To The Customer

- -Reduced Total Ownership Costs (TOC)
 - Leveraging Commonality
 - Executing Technology Refreshment
 - Exploiting Commercial OEM Support Infrastructure
- -System Infrastructure Performance Improvements Facilitate Functional Upgrades
- -Elimination of Obsolescence
- -Guaranteed Operational Availability

To Industry

- -Strategic Discriminator as a System Integrator
- -Expanded Business Base
 - Technology Refresh and Insertion Planning
 - Management of Spares, Spares Inventory, and Repairs
- –Uniform Resource Planning Eliminates Large Shifts in the Manning Profile to Re-Design for Obsolescence

Total System Sustainment Enablers

- Primarily through Implementation of the Systems Integration Approach
- Leveraged by business and engineering approaches
 - Effective Public-Private Partnerships
 - Performance-By-the-Hour™ Contracts ~ The Incentive for Industry to Reduce TOC, Which In Turn Results In:
 - MFOP ~ Maintenance Free Operating Period Design
 - Employing Use of PHM: Prognostics and Health Management
 - Web-Enabled Distance Support (e.g., NavalSupport.com) and Distance Training
 - Autonomic Supply Chain Management and JIT Support

An Integrated Solution Set for Full Service Support

Pre-Systems Acquisition Activities Life Cycle Data Management in Handbook 859

Presented Friday, 4 March 2005 NDIA TID CDM Symposium Miami, Florida

Cynthia C. Hauer Millennium Data Management, Incorporated Huntsville, Alabama



Defense Acquisition Management Framework "Enabling Logistics for the 21st Century"

User Needs and Technology Opportunities

B

Where Should DM Begin?

Technology Concept System Development Production & **Operations &** Refinement Development And Demonstration Deployment Support Sustainment **Pre-Systems Acquisition Systems Acquisition Concept Design Design Readiness FRP Design** Review Review Review Where does DM usually "begin"?

Defense Acquisition Management Framework "Enabling Logistics for the 21st Century"



Why is that?

- Usual answers ... and questions that I wish I could ask!
 - "too intrusive"
 - Really? How is it that documenting decisions and good planning are problems for you?
 - "too expensive"
 - We invest < 1-3% of total program dollars in DM, on a good day</p>
 - "too soon"
 - And you wanted to wait until when?? Oh, yeah, right after the disaster!
 - "we're not in production, yet"
 - No, and it's highly likely that you won't get there without better management of your process and your program!
 - And if you do, how are you going to know what you did to get to production?

"we haven't made up our minds what we want to do, yet"

- Don't you need some traceability for your decisions and your requirements, as they evolve? Is this really an ad hoc program?
- Don't you want a defendable, supportable record of activities, plans, decisions, potential, and envisioned contractual outcomes?



"we'll let our engineers/program managers/secretaries do DM"
 Well, we've all seen how well THAT's working ...

Agenda

What is Handbook 859? A brief tour Questions to be answered What is the landscape? Objectives of pre-acquisition activities Focus Questions Sample value-added activities and contributions The Case for Early Intervention Aspects and elements of the DM Model



GEIA-859 was released on 4 August 2004 In ANSI progression, now, and should be ANSI-859, already

What is Handbook 859?

 Application guidance for ANSI-859
 Industry Government Consensus Standard for Data Management

- Implements 9 essential and core principles for Data Management
 - Across sectors, across buyer and seller organizational boundaries
- Submitted to GEIA this week
 - 60-90 day approval cycle
 - Review, comment, resolution of comments, and voting by GEIA member companies



Look and Feel for Handbook 859 Content Overview

Foreword

- Introduction
- How to Use the HB
- Intended Audience
- Resources
- Companion Documents
- Annexes
 - Intellectual Property, Acknowledgements, Continuous Improvement, Case Studies, Flow Templates, Glossary, References, Matrix from ANSI-859 to Handbook 859

- Full lifecycle DM
- Identification and Definition
- Acquisition and Preparation
- Data Asset Control
- Data Retention and Disposition
- Data Strategy
- Concept of Operations
- Data Preservation

Principle 1: GEIA-859



Questions Answered by Handbook 859 (Pre-acquisition Section)

• What is the scope of the DM process?

- What activities comprise the DM process?
- How is DM activity related to other functional activities and disciplines?
- What are the DM objectives for each phase of the program life cycle?
- What DM activities are performed in each phase? What decisions are made and what are the criteria for making them?
- What are the benefits derived from DM activities, and what are the risks if the activities are not performed?
- How can the DM process be measured, and how do the measurement metrics relate to DM objectives, and management objectives?



Scope of pre-RFP Activities
 Activities conducted very early in the DM lifecycle

- Actually may precede the beginning of the program lifecycle
 - **Example:** requirements for a new capability
 - DM should capture and manage the documentation of initial requirements, significant changes in direction, and trade-offs that are made

DM perspective ensures/provides data for later requirements traceability



DM Activities: 1) planning for DM across the lifecycle; and 2) Achieving and applying a Strategic DM perspective.

Sample Value-added DM Activities

Pre-RFP

- Data Strategy, CONOPS, data requirements
- Concept Refinement
 - Program decision criteria, provenance, outcomes
 - Technology trades analysis results
 - Down select/decision criteria
 - Requirements and objectives status/evolution
 - Emerging logistics/engineering issues
 - Test and evaluation issues
 - Modeling and simulation inputs, outputs, parameters, outcomes



Early ID, intervention, communication, and status tracking

Sample Value-added DM Activities, 2

Technology Development

- Analyses on technology evolution
- EE, ME, human factors issues
- Architecture design, trades

System Development and Demonstration

- SEMP, TEMP planning and element integration
- Interface working group support
- Flight test planning
 - Optics, telemetry, radar, quick-look data planning and support
 - Coordination with test ranges and facilities
- Production and Deployment
 - Spares and repairs issues
 - Next generation production decisions and challenges
 - Packages of data for review, decision, and communication



Note that the earlier the involvement, the more value is added

Sample Value-added DM Activities, 3

Operations and Support FMS data packages Archival packages Continued contract support (access ...) Logistics spares and repairs Support to the item manager Release management activities



Early, sustained involvement assures that data is in place

These contributions are the equivalent of taking as aspirin a day to prevent heart attacks and strokes!

Aggregate Benefits

Acquisition strategy is enhanced

- Data is identified for access only, for retrieval schedules and needs, and for acquisition priorities
- Requirements are validated, tracked, and verified
 - Product data as well as supporting business data
 - Intellectual property considerations are identified early on
- Down-select teams
- Program management tasks are supported
 - Decisions, actions tracked
 - Provenance established
- Logistics support strategy is provisioned correctly
 - Appropriate data is identified
 - COTS planning
 - Proper data is acquired, if access is not sufficient
 - Costly contract modifications are avoided* [~2M, generally]
- Post-contract issues are addressed
 - Data marking, data rights
 - Records management
 - Product release management
 - Contractual requirements are supported

* This doesn't count such aspects as Intellectual property and data rights "changes"

New Perspectives

Data acquisition or information acquisition? They are different things They are treated differently by data providers They are valued, considered, and sold at radically different prices "Insight" management as opposed to "oversight" management Expectations are clearer, outcomes are

structured and pre-ordained



Isn't this what Logistics is all about?

Objectives of the Pre-Acquisition Phase, for DM

- Focus: types of data to be generated, accessed, acquired, exchanged (inputs and outputs)
- Focus: the life cycle of the data, the system being designed, and the uses to which data will be put
- Focus: sizing the solution
- Focus: identifying existing or emerging constraints, facilitators, roadblocks, inconsistencies, redundancies



The DM Process

Constraints

- Management support, facilities, resources, training
 - Defined processes/procedures_
 - Effective working relationships
 - Acquisition and support strategies
 - List of required contractual data
- Regulations, standards, handbooks, and manuals.
- History, lessons learned, and success case studies.
 - Commercial practices
 - Tools and technology



- Timing
- Resources
- Laws and policies
- RFP/contract
- Infrastructure

Outputs

 Documented DM processes
 DM CONOPS & strategy
 RFP & contract data requirements defined, scheduled, and priced
 Standard descriptions of data products

- Current listing of required data
- Known data status
- Point of use data provisioning
- Archival or disposal plan
- DM performance measurements
- Lessons improved
- Program success, user support enhanced

Characteristics of the DM Process Model

Inputs

Information needed to initiate and perform the process

Constraints

Factors or information which inhibit, condition, or limit the process

Facilitators

 Information, tools, methods, and technologies which enable or enhance the DM process

Outputs

Results derived from the process, and the information provided by the process, itself



Elements of the Top-Level DM Activities Model

- Laws and Regulations
- RFP and contract
- Acquisition and support strategies
- User requirements
- Provider recommendations
- DM planning, procedures, and training
- Data use metrics
- CONOPS/Data Strategy
- Data requirements to be placed on the contract

- Data provider proposals
- Data Management policy, procedures, and training
- Data provider submittals
- Product data
- Requests for data
- Access rules
- Negotiated and revised list of required data
- Data status
- Data provided to the point of use
- Availability for access
- Archival and disposal



Characteristics of the DM End Process

- Integrates DM process and supporting system
- Captures and manages configurable items which comprise the technical baseline
- Correlates and provides traceability among requirements, design, decisions, and rationale

- Supports configuration management procedures
- Serves as a ready reference for the development team
- Uses common and compatible information systems, tools, and formats

Translation?



Broad Scope for DM

Relates to the complete program life cycle

- Systems engineering, program management, configuration management, business management, operational support, retention, archival
- Embraces use of common buyer and seller data formats, when and where feasible
- Reflects seamless integration of DM with all other functional activities and disciplines
- Extends to true "management of data" to create and provide a structure for insight management



Setting the Stage for Effective DM

- USG and Industry are moving to more concurrent acquisition process using Integrated Product Team management
 - This requires timely, accurate, cross-functional access to data
 - The IT infrastructure is essentially "ready"
 - DM processes and scope have lagged behind technology
- Traditional DM processes are still valid
 - New paradigmatic shift to "digital" format rather than paperbased products, and "access" rather than "acquire"
- Benefits and ROI are easily discerned
 - Better trade-off decisions
 - Problem identification comes much earlier in the life cycle and the process

Cycle times are reduced for decisions, information processing



Overhead costs eliminated or reduced for receiving, storing, and processing hard copy documents and product data

Outcomes Gained

Better trade off decision support Enhanced communication between data providers and data acquirers Earlier identification of problem areas Decreased cycle times for decisions and information processing Elimination of overhead costs of receiving, storing, and processing hard copy documents



Sample DM Metrics

- On-time deliveries by year
- Deliverables delinquencies
 - Root process drivers by year, by program
- Classified cabinets eliminated by year, by program
 - Contract retirement, archival, retention schedules
- Unclassified documents scanned for use
 - Search time reduced or eliminated, offsite and onsite
- Electronic data interchange
 - Enabled by year, by program
- Library/website hits and patron visits
- Average DM funding by product line, by program, by year
- Aggregate DM core process consistency and improvements by year, by program
- Class II reasons for change (requirements, optics, SW, tech data, supportability, parts obsolescence) by program, by year
- On-time changes, YTD
- Class II change trend
- Data errors found by EDS
- Paper purchase requests versus electronic purchase requests
- Paper or electronic TDPs



DM Metrics for Management

Program M, 54

am N, 106

Program P 132

Program Q 10

Program R, 15

- Program S, 62



Program T, 101

Program V, 460

Program U, 144





■ No Images ■ Poor Quality ■ Incorrect Image ■ No Document Record ■ Incomplete

Next: Acquisition and Preparation

- The right amount of data will be bought, delivered, or accessed
- The best data to support decision making and other customer functions will be available when needed
- Timing of delivery will be optimized
- Statements of work and objectives are more easily written, clearer, and resulting in fewer unpleasant surprises for the buyer and the supplier
- Data products will be discoverable, and when retrieved, will be associated with other relevant data products, product data, and views
- Data products and views will have metadata that help to ensure appropriate use and re-use

It will be possible to recreate the set of data products and views in use at a given point in time

Summary

Lots has happened in DM DM's not your father's Oldsmobile, anymore The benefits gained from the investment in the solution don't even compare ANSI-859 and Handbook 859 are ready to assist in better DM for you and your organization The DM panel has much more ahead XML business objects modeling Automation of DM processes inside PDM tools DAU course modules for 13 career fields Available for industry as well as for government

Sovernment Electronics and Information Technology Association A Societ of the Flectronic Industries Allience MP1/4

EIA-836 CM Data Exchange and Interoperability CM Data to Support the Logistics Process

Alan Lager, MLR Associates

6585 Maggiore Drive Boynton Beach, FL 33437 (561) 735-9511 / (561) 704-6646 <u>alan e lager@msn.com</u> <u>http://www.mlrassociates.com</u>

NDIA TID Symposium Miami, FL ~ March 4, 2005

8/31/2016



CM Data Exchange and Interoperability Agenda

The Importance of CM Data to Logistics What EIA-836 is Applying EIA-836 Revision/Version History Continuing EIA-836 Development EIA-836 Five Year Plan

The Importance of CM Data to Logistics

- A primary purpose of CM has always been to assist in logistic support
 - But
 - Evolutionary Acquisition
 - Reduced Logistics Footprint
 - Rapid Deployment & Product Support
- Demand
 - Flawless configuration identification and control
 - Known multiple configurations of end items and corresponding support systems

In other words -- Timely, Accurate CM Data!!

8/31/2016



What EIA-836 Is



The ability to make sense out of the stuff

- Reference Model & Data
 Dictionary
 - Data Elements
 - Definitions
 - Relationships

The ability to create Information Exchange Sets

Business Objects

The ability to find unambiguous definition of all the information you need to know about CM (but were afraid to ask)



NDIA TID Symposium Miami, FL ~ March 4, 2005



What EIA-836 Is



8/31/2016

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6

Revision/Version History

- Project initiated January 2000
- Initial release published 15 June 2002
 - Reference Schema Version 1.0
- Incremental Rev with "standalone" Business Objects - January 2004
 - Version 1.1 (Redlined) & Version 1.2 (Redlines Accepted)
- EIA-836 Revision A (Schema Version 2.0) in process
 - New look
 - Newer XML technologies
 - Consistent design methodology
 - Focused on objects and relationships
 - Less redundancy, easier creation and maintenance

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8/31/2016

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Army Aviation - Logistics For The Warfighter



Dr. Thomas Pieplow Associate Director for Aviation, AMCOM



Challenges We Face

Demands will increase from FY04 rates ... which were an all time high





Aviation Will Always Be A Key Component

Apache



Black Hawk





Projected

Demands

Demands Continue to Increase FY05 Projects 2% Higher Than FY04 and Growth Since Sep 11 Over 65%

41021GS01p





No Matter How You Measure, Aviation Is The Backbone Of Support \$M



* Projected





Army Fleet in OIF

511,276 Total Hours: 01 Feb 03 – 28 Feb 05



OPTEMPO Significantly Higher than Peacetime



Army Fleet in OEF

73,087.7 Total Hours: 01 Feb 03 – 28 Feb 05



OPTEMPO Significantly Higher than Peacetime







Challenges We Face

Demands will increase from FY04 rates ... which were an all time high

Support for OEF/OIF units has been exceptional, but improvements must extend to all aviation customers



AVAILABILITY IMPACTED BY FUNDING Shortfalls







This tracks the percent of the total requirement that is on the shelf and available for issue













Backorder Trends Recent History









Reset now constitutes single largest customer







1/4 CAV, Baqubah, Iraq A Warrior's "Thank You"

Dear Sir,

I am CW3 Robert Carpenter. I am writing to express my gratitude for the quality rotor blades that Bell has produced for my helicopter, the OH-58D Kiowa Warrior.

On April 7th, while flying a combat mission near the city of Baqubah, Iraq my KW was struck on one main rotor blade by an RPG (rocket propelled grenade). The RPG exploded and destroyed a 4 foot section, leaving about two feet of rotor blade on the end. The spar was also damaged and I still don't know how it held together.

Thank you.



v/r, Robert Carpenter CW3, U.S. Army



"... I am writing to express my gratitude for the quality rotor blades that Bell has produced..."





What We Are Facing

Demands will increase from FY04 rates ... which were an all time high

Support for OEF/OIF units has been exceptional, but improvements must extend to all aviation customers

The investments are yielding significant deliveries but problem items still must be targeted



APACHE

Total Items - 3,311

Individual Item Assessment

Fully Supportable Today

Partially Supportable Today/Fully Within 12 Months

Partially Supportable Today/Fully After 12 Months

CHINOOK Total Items - 1,901





Tactical Focus Has Been On Warfighter

OIF I/OEF IV (30 SEP 03) 643 Aircraft 268 Non-Mission Capable (NMC)

75 NMC Due to Supply



537 Aircraft 78 NMC 7 NMC Due to Supply



- Emphasis now on "Preset" of aircraft prior to deployment
- OIF/OEF units first to receive critical parts delivered from industry
- Focusing on NMCS is the quickest means for AMCOM to influence theatre readiness



BACKORDER REDUCTION PLAN





What Customers Have Seen Over the Past 12 Months

\$350M+ in engines, transmissions, blades, and APUs received over past 180 days - additional \$800M being delivered over next 36 mos

On hand inventory for Top 18 readiness drivers up \$58M		Assets Available			
	Backorders <u>Decreased</u>		for Issue Increased		
701C Engine	35%		60+		
Blackhawk APUs	66%		86%		
Chinook APUs	22%		200%		
Blackhawk					
ATransmissions	35%		200%		
LTransmissions	35%		200%		
Leading edge maintenance on Blackhawk Main Rotor Blades					
	Blackhawk Solenoid Valve Kiowa Warrior		\$3.8M		
"Preserving Valuable Assets"	Power Supply		\$5.6IVI		



Industry Has Responded

Top 25 Apache & Chinook Items

- Schedule improvements ranged from 10-80%
- Rotor Shaft
 - Yield increased 64%
 - Production lead time decreased 83%

Blade

 Production cycle decreased from 23 to 10 months

Kiowa Warrior

- Repair turn-around improved 68%
- Mast Mounted Sight
 - Production time reduced 44%

Sikorsky Blackhawk

- Production improved across the board
- Main Blade
 - Production has increased from 20 to 75/month
- Tail Blades
 - Production has increased from 20 to 60
- Structural Supports (Top Reset Item)
 - Ramped from a cold case of 20/mo to 200/month by JAN 05

Organic Depot Capacity

 Expanding through partnership contracts with industry



The Focus Is On Production

\$M			
<u>Deliveries</u>		<u>Investment</u>	
\$280.6	Sikorsky	\$1,022.6	
44.4	Lockheed	476.4	
694.8	GE	839.8	
112.4	Boeing, Phil	458.6	
83,8	Boeing, Mesa	264.2	
182.2	Honeywell	386.1	%
75.3	Parker Hannifin	218.8	100 39.5%
64.1	DRS Tech	170.4	80 Moving deliveries left with incentives & intensive management
30.0	Bell	178.6	60
47.2	Raytheon	74.9	40
\$1,614.8		\$4,090.4	
			\$63M +
	All Suppliers		2002 2004 2006 2008 2010
<	\$5,869.0		Long Lead Items



What We Are Facing

Demands will increase from FY04 rates ... which were an all time high

Support for OEF/OIF units has been exceptional, but improvements must extend to all aviation customers

The investments are yielding significant deliveries but problem items still must be targeted

Limited supplier base and age of technologies challenges more aggressive accelerations



Production Issues We're Addressing

Castings and forgings have leadtimes ranging from 12-36 mos

- Alcoa only source of aluminum forgings for 58D Rotor Heads minimum 40 week leadtime
- New sources want assurance of future business to justify investing facilitization capital
- We've used RIA and are qualifying vendors via our Prototype Integration Facility (PIF)

2nd & 3rd tier vendor base diminishing while existing sources are saturated

- Timken only qualified sources for certain bearings
- Primes, OEMs, and depots chasing the same single sources for piece parts
- Qualification process for new sources requiring First Article Test (FAT) and/or Product Verification Audit (PVA) being streamlined

Certain Critical Safety Items (CSI) require raw materials with limited availability

- Titanium sheaths for blades and ESR steels for gears
- Long-lead material now being funded where appropriate

Depot production offers most expedient deliveries

- Unserviceables delayed in theatre combination of TASM and Desert Express have improved performance
- CCAD Partnerships have enabled component production to grow by more than \$100M from FY04 levels






IEEE Standard for Software Configuration Management Plans



Purpose:

Establishes the <u>minimum required</u> <u>contents</u> of a Software Configuration Plan and defines the specific activities to be addressed and their requirements for any portion of a software product's life cycle.



Use of an IEEE Standard is wholly voluntary.

The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard.



This Standard applies to the entire life cycle of critical software.

The Software Configuration Management Plan (the Plan) documents

- what SCM activities are to be done,
- how they are to be done,
- who is responsible for doing specific activities,
- when they are to happen, and
- what resources are required.



The Plan shall be partitioned into the following six classes:

- 1. Introduction: Purpose, Scope, Key Terms, and References.
- 2. SCM Management: *(WHO?)* Identifies the responsibilities and authorities for accomplishing the planned activities.
- 3. SCM Activities: (WHAT?) Identifies all activities to be performed.



The Plan shall be partitioned into the following six classes:

- 4. SCM Schedules: (WHEN?) Identifies the required SCM activities with the other activities in the project.
- 5. SCM Resources: (HOW?) Identifies tools and physical and human resources required for execution of the plan.
- 6. SCM Plan Maintenance: Identifies how the Plan will be kept current while in effect.



Introduction:

- 1. Overview of the software development project.
- 2. Identification of the Software CI (s) to which SCM will be applied.
- 3. Identification of other software to be included (e.g., support or test software).
- 4. Relationship of SCM to the hardware or systems configuration management activities.
- 5. The degree of formality, dept of control, and portion of the software life cycle for applying SCM.
- 6. Limitations, such as time constraints.
- 7. Assumptions that might have an impact on the cost, schedule, or ability to perform defined SCM activities.



SCM Management:

- 1. Organization
- 2. SCM Responsibilities
- 3. Applicable Policies, Directives, and Procedures



SCM Activities:

- 1. Configuration Identification
- 2. Configuration Control
- 3. Status Accounting
- 4. Configuration Audits and Reviews



- 1. Configuration Identification
 - Identifying Configuration Items
 - Naming Configuration Items
 - Acquiring Configuration Items
- 2. Configuration Control
 - Requesting Changes
 - Evaluating Changes
 - Approving or Disapproving Changes
 - Implementing Changes



- 3. Configuration Status Accounting
- 4. Configuration Audits and Reviews

- 5. Interface Control
- 6. Subcontractor/Vendor Control



SCM Schedules:

- 1. Establishes the sequence and coordination for the identified SCM activities and events.
- 2. Dependencies among all SCM activities (Milestones and events).
 - Configuration Baselines
 - Implementation of Change Control
 - Start and completion dates for a Configuration Audit
- 3. Duration of the Plan.



SCM Resources:

- 1. Software Tools
- 2. Techniques
- 3. Equipment
- 4. Personnel

5. Training necessary for the implementation of the specified SCM activities



SCM Plan Maintenance:

- 1. Who is responsible for monitoring the Plan.
- 2. How frequently updates are to be performed.
- 3. How changes to the Plan are to be evaluated and approved.
- 4. How changes to the Plan are to be made and communicated.







Summary:

The IEEE Standard permits significant flexibility in preparing an SCM Plan.

A successful Plan reflects its project environment.

It should be written in terms familiar to its users and should be consistent with the development and procurement processes of the project.





Military Engineering Data Asset Locator System (MEDALS) Data Quality

Warren M Scott

Federal Center	269.961.5509
74 Washington Ave N STE	7 DSN 661.5509
Battle Creek MI	FAX 269.961.4715
49017-3084	
E-Mail	warren.scott@dla.mil

Defense Logistics Information Service Customer Support Toll Free: 1-877-352-2255



8/31/2016



The Defense Procurement Reform Act of 1984 Public Law 98-525, Section 1252



Mandated procedures for developing, to the maximum extent practical, a centralized system to identify the repository within the Department of Defense (DoD) responsible for technical data relating to an item and the extent of data on file in the repository with respect to that item.



MEDALS

The DoDs Centralized Indexing Authority

- Getting the Customer to the Desired Repository Faster
- The MEDALS program supports over 50,000 queries per month
- Saves the Repositories Time, Money, and Resources



8/31/2016





Indexing A Family of Systems





JEDMICS CENTRA ACMS DBASE ATIS









MEDALS CURRENTLY INDEXES OVER 42 MILLION ASSETS











Participating Repositories

Boeing DLA DSC-Columbus DSC-Richmond DSC-Philadelphia DLIS-NATO DAPS, Newport, RI

Air Force

OO-ALC, Hill AFB, UT OC-ALC, Tinker AFB, OK WR-ALC, Warner Robins AFB, GA

Lockheed



Army

AMCOM, Redstone Ars., Huntsville, AL ARDEC, Picatinny Ars., Dover, NJ TACOM, Warren, MI Rock Island Ars., Rock Island, IL CECOM, Ft. Monmouth, NJ Edgewood Chemical and Biological Command

Sikorsky

Honeywell

Marine Corps

MCLB, Albany, GA





Participating Repositories

General Electric

Lucent

Navy

Boeing Lockheed

NSY, Portsmouth, NH NAVICP-M, Mechanicsburg, PA NSWC, Crane, IN NSWC, Indian Head, MD NSWC, Dahlgren, VA NSY Norfolk, Portsmouth, VA NSY Puget Sound, Bremerton, WA NUWC, Keyport, WA NSY, Pearl Harbor, HI



NSWC, Port Hueneme, CA NSWC Indian Head, Det Earl, NJ SPAWAR Charleston (Coming soon)



General Dynamics Ea

Eaton

File Edit View Favorites Tools Help

6



This Site Reviewed Quarterly Last Undated: Tuesday, February 24, 2004

v

A



CONTRACTOR ACCESS

Must have a DoD Sponsor

- Qualified U.S. Contractor is certified via the Military Critical Technical Data Agreement, DD Form 2345
- The contractor (CAGE) organization has been verified to be in good standing with the DoD
- A valid Registration for Scientific and Technical Information Services, DD Form 1540, is on file with the Defense Technical Information Center (DTIC)
- National Agency Check (NAC) or equivalent type of Investigation



CONTRACTOR ACCESS

- The MEDALS program manager reserves the right to withdraw services from any contractor individual or parent company for any misuse of the intended use of the MEDALS program
- Access to the MEDALS program does not imply or grant access to the technical data indexed
- MEDALS access when engaged in an active contract, project, or program where within its scope it states that a tool such as MEDALS is required or when a DoD Sponsor determines a need for services is required
- MEDALS access is not available to foreign nationals



8/31/2016

CONTRACTORS ACCESSING MEDALS

ALPHIA DATA CORP AMSEC LLC APPLIED ORDINANCE TECHNOLOGIES ARINC ENGINEERING SERVICE BMT DESIGNERS AND PLANNERS BOEING CACI CACI-ASG CHEROKEE INFORMATION SERVICES EG&G **ENVISIONEERING** GENERAL DYNAMICS **GRYPHON** IBM **INTERGRAPH** LOCKHEED MARTIN INFORMATION **TECHNOLOGIES**

MADISON RESEARCH CORP **ML TECHNOLOGIES** NGIT PECKHAM **QUALITY PERFORMANCE INC QUANTI TECH INC REGENT SYSTEMS INC** SAIC SCIENCE APPLICATION INTERNATIONAL CORP **SEMCOR INC SOBRAN INC** SUPPORT SYSTEMS ASSOC. INC TEAM KEYPORT SERVICES **UNIDYNE** WFI GOVERNMENT SERVICES INC

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SERVICE REPOSITORIES

AIR FORCE

Address

Engineering Data Support Center OC-ALC/LGLDOS 3001 Staff Dr., Ste 1AC83A Tinker AFB OK 73145-3041 Repository Indexed in MEDALS URL to OC-ALC WEB Repository https://jedmics.tinker.af.mil

Engineering Data Support Center OO-ALC/LGVPE 6032 Fir Ave., Bldg 1237 Hill AFB UT 84056-5820 Repository Indexed in MEDALS URL to OO-ALC WEB Repository https://jedmics.hill.af.mil

Engineering Data Support Center WR-ALC/LGEDB 480 Second Street, Suite 200 Robins AFB GA 31098-1640 Repository Indexed in MEDALS URL to WR-ALC WEB Repository https://jedmics.robins.af.mil

8.5 x 11 in

Phone/E-Mail

DSN 336-4422 COM (405) 736-4422

oc-alc.lgldo.cs@tinker.af.mil

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DSN 775-6078 COM (801) 775-6078

hill.jedmics@hill.af.mil

DSN 472-3008/3009 COM (478) 222-3008/3009

jedmics@robins.af.mil

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Inquiries Based On Technical Drawing Information

Drawing Asset Identifier Drawing Number CAGE Code Document Type Revision Level Drawing Number/CAGE Drawing Number Part Number/CAGE Part Number NSN/NIIN **Document Title**










MEDALS TO REPOSITORY WEB INTERFACES

CURRENTLY ACTIVE INTERFACES

DSC-Columbus
DSC-Philadelphia
DSC-Richmond

AMCOM, Redstone Ars, Huntsville, AL
TACOM, Warren, MI
Rock Island Ars., Rock Island, IL
CECOM, Ft. Monmouth, NJ

OO-ALC, Hill AFB, UT
OC-ALC, Tinker AFB, OK
WR-ALC, Warner Robins AFB, GA

•NAVICP-M, Mechanicsburg, PA
•NUWC, Keyport, WA
•NATEC, San Diego, CA
•NSWC, Port Hueneme, CA
•NGSS, Pascagoula, MS
•SUPSHIP, Bath, ME

FUTURE INTERFACES

- ARDEC, Picatinny Ars., Dover, NJ
- MCLB, Albany, GA
- NSWC, Crane, IN



MEDALS

WHAT MEDALS IS "<u>NOT</u>"

A repository of digital images

- Digital images/ technical data are the sole responsibility of the repository
- A pass through or portal to bypass access and security protocols for digital images/technical data maintained by a repository
 - ▲ The repository is responsible for the access and permissions to their digital images/technical data
 - MEDALS will not violate Proprietary Data issues or intellectual Property issues

The owner of the data indexed

▲ MEDALS is a steward of the repositories indexed data



MEDALS

WHAT THE MEDALS PROGRAM <u>"IS"</u>

- A tool for the repositories in assisting customers in locating digital images/technical data
 - Using MEDLAS first alleviates the necessity of the repository to field queries regarding the availability of digital images/technical data

A way to reduce infrastructure within a repository: saving time, money, & resources

MEDALS is always available

- ▲ DLIS staffs a 24/7 customer support center
- MEDALS PMO available during business hours for customer support



MEDALS & EIA-859

Where does MEDALS fit in with DM and EIA-859

- Contemporary Data Management Model
 - ▲ MEDALS is available as a tool for customers to verify location prior to repository access. First step in the process of determining if a repository is maintaining specific data



MEDALS & EIA-859

- 4.0 Principle: Identify Data Products and Views so That Their Requirements and Attributes can be Controlled
 - * "Data is of value to the enterprise when it can be located or accessed by users. Metadata, or data about data, is essential for data managers and others to identify, catalog, store, search for, locate, and retrieve data"
 - MEDALS is the fundamental nature of this concept



EIA-859 Table 4-1 Metadata Examples & MEDALS Tables

Attribute

- Author
- Classification
- Contract Identifier
- Date Modified
- Date Originated
- Document Number
- Document Owner
- Document Size
- Document Type
- Environmental Requirements
- File Format
- File Size
- File Type
- Enterprise Identifier
- Related Document ID
- Related Product ID
- Revision Identifier
- Rights
- Storage Medium

MEDALS Attributes

- Repository Location
- Repository Information
- Security Code
- Distribution statement
- File Index Date
- Document Number
- Document Size
- Number of Sheets
- Document Type
- Nuclear Hardness Critical Items/Processes (HCI) or (HCP)
- Yes/No field indicating distribution authorization to Foreign Nationals
- Level One SUBSAFE
- File Type
- CAGE Code
- Associated Weapons Systems Code
- Associated Part Numbers
- Associated NSN's
- Revision Level
- Data Rights Code



CONCLUSION

- The MEDALS program is a logical and complementary fit with EIA-859
 - Establishing and maintaining an indexing account is easy
 - MEDALS infrastructure is in place and working, cost wise it is advantageous for the repository
 - MEDALS is a way to reduce infrastructure within a repository
 - The burden of fielding inquiries for the availability of digital images/technical data can be avoided through the use of MEDALS
 - MEDALS is flexible
 - ▲ MEDALS tables or Attributes can be established to fit with EIA-859 requirements



MEDALS

QUESTIONS