CM 101
A Basic Introduction
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TARDEC CM Team
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**Report Documentation Page**

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**Standard Form 298 (Rev. 8-98)**
Prescribed by ANSI Std Z39-18
A process for establishing and maintaining consistency of a product’s performance, functional and physical attributes with its requirements, design and operational information throughout its life.
The CM Activities

- Management & planning
- Configuration identification
- Configuration Status Accounting (CSA)
- Configuration verification & audits
- Configuration control
- Digital data management
• A continuous task
• Synchronized with the Acquisition Strategy, System Engineering and Logistical Planning
• Implies a defined CM Process and the use of CM Process metrics

Inputs:
• Program Initiation
• Management Support
• Working Relationships
• Resources & Facilities
• Training and Guidance
• Time, Resources & Planning

Management and Planning

Outputs:
• RFP & Contract Input
• Documented CM Process
• CM Plan

Contract language (SOW) is the most critical output and impacts program cost and schedule!!
The Performing Activity selects items for management
Must have unique identification of products and documents
Is driven by acquisition & support planning
May use the Product Work Breakdown Structure to assist in identifying top-level items

**INPUTS:**
- Management & Planning
- Logistics Maintenance Plan
  - Systems Engineering Requirements / Functional Analysis
  - Allocation & Synthesis

**CONFIGURATION IDENTIFICATION**

**OUTPUTS:**
- Product & Document Identification (Naming, marking, serialization, etc.)
- Approved Configuration Documentation
- ERRs
Configuration Status Accounting

- Provides a listing of baselines
- Provides the status of changes & audits
- Ensures all use the same design and documentation
- Defines and populates a database of products and associated documentation

**INPUTS:**
- Configuration Control
- Approved Configuration Documentation
- Verification, Validation, Action Items
- Performance Measurements

**OUTPUTS:**
- Status & Configuration Information
Verification & Audits

- Does product meet requirements?
- Does documentation match product?
- Two primary types of audits
  - Functional Configuration Audit (FCA)
  - Physical Configuration Audits (PCA)

**INPUTS:**
- Management and Planning
- Configuration Status Accounting
- Approved Configuration Documentation
- Physical CI/CSCI, Test Results, Mfg. & Engrg. Tools/Documentation

**CONFIGURATION VERIFICATION AND AUDIT**

**OUTPUTS:**
- Verification, Validation, Action Items
- Confidence; Verified Product and Validated Process
Configuration Audits Explained

Functional Configuration Audit (FCA):
• Used to verify that the planned performance of the CI meets the requirements stated in its performance specification
• Basically checking performance

Physical Configuration Audits (PCA):
• Used to examine the actual configuration of the CI that is representative of the product configuration
• Lead to the establishment of a Product Baseline
• A PCA involves:
  – Checking drawings against IBOM
  – Verifying that part(s) depicted on drawing are a part of the vehicle
  – Comparing production parts against drawings

The Product Baseline is the approved technical documentation which describes the CI configuration during the production, fielding/deployment and operational support phases of its life cycle!
Configuration Control

• Uses a **systematic process** to identify, document, justify, evaluate, approve, incorporate and verify **changes**
  – The Configuration Control Authority (CCA) controls the product
  – The Current Document Change Authority (CDCA) controls the documentation
  – An Application Activity (AA) uses the product or documentation

**INPUTS:**
- Configuration Identification
- Need for Change
- ECPs, RFDs
- Contractual Provisions

**CONFIGURATION CONTROL**

**OUTPUTS:**
- Change identification, Documentation & Disposition
- Approved ECPs, RFDs & Implementing Direction / Authorization
Current policy, business practice and information technology supports digital data.

The former preference for the Government to buy access to digital data, rather than have delivery of data, has changed.

A best practice is to have an Integrated Data Environment (IDE).

Figure 9-1. CM Related Data Management Activity Model
Benefits of CM

Why perform CM?
• Buyers and sellers have a common basis for the product’s acquisition and use
• Decisions are based on accurate and current information
• Enhanced production repeatability for parts
• Applicable data is readily available, avoiding guesswork and trial and error, costly errors of ad hoc, erratic change management and downstream surprises, leading to cost and schedule savings
• Verification and recording of changes are incorporated into the product
• Establishment and maintenance of a high level of confidence in the product information

Without CM:
• Schedule delays and costs for changes
• Mismatch with support assets
• Equipment inconsistent with maintenance instructions; equipment failures
The Next Steps for a Program/Project

Given the numerous benefits of CM, here are the next steps in implementing Configuration Management practices:

1. Ensure that CM-related language is incorporated into the contract**
   - Contact the CM team for Statement of Work (SOW) development
   - CM team will create a SOW tailored to the program
2. Enforce the contract to ensure receipt of deliverables
3. Work with the CM team to setup configuration control boards, data management training, etc.

** The contract documentation (SOW & CDRLs) is the MOST CRITICAL piece in the CM process
- It stipulates everything that will occur after the contract is signed
- If its not in the SOW, it will cost more to add it at a later stage
Primary CM References

- MIL-HDBK-61A: Configuration Management Guidance
- EIA-649A: National Consensus Standard for Configuration Management
- MIL-STD-974: Contractor Integrated Technical Information Services (CITIS)
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