



A Configuration Management Primer for Logistics Professionals

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Agenda

- Purpose and elements of CM
- How to spot 'good CM'
- How CM and Logistics play together
 - Digital Thread
 - Management of Configurations
 - Quality of Changes
 - Better traceability
- Question/Answer

About CMstat

- Founded in 1989 to provide CM-focused COTS software for the A&D industry
- Products based on CM principals found in EIA-649C
- Expanded to Data Management per EIA-859
- Recognized as SMEs in our field
- **Active in:**
 - SAE G-33 Committee
 - ACDM
 - CMPIC
 - IpX (formerly CMII)

Check out our CMSights Blog for more topics:

<https://cmstat.com/blog/>

About Lisa

- BSME
 - Past work on Government Contracts
 - On the job training in Logistics requirements
- Certifications and training
 - CMII-C
 - CMPIC Masters/SME
 - CMPIC CM Assessor
 - Data Management

Introduction

EIA-649C Defines Configuration Management:
Configuration Management (CM) is a technical and management process applying appropriate processes, resources, and controls, to establish and maintain consistency between product configuration information, and the product.

CLEP Defines Logistics Engineering:
Logistics Engineering is the professional engineering discipline responsible for the integration of support considerations in the design and development; test and evaluation; production and/or construction; operation; maintenance; and the ultimate disposal/recycling of systems and equipment.



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Two Main Scenarios

1. Logistics involved from beginning of the lifecycle
2. Product has been created, design development complete, product in service and now needs to be overhauled

For now, we'll stick with scenario #1

System of Systems

- CM is important to logistics because:
 - Supportability
 - Testing scenarios
 - Feedback of operational data
 - Interfaces to other/supersystems
- Without a comprehensive plan, these complex requirements can fall by the wayside.



Logistics-informed Design

Bradley Fighting Vehicle

Maintenance and Support Contract

Major enhancements undertaken at once

- Fire Suppression System Changes
- Hydraulic Reservoir Relocation
- Stowage additions
- Crew area updates
- Wiring Harnesses

Length: 6.5 m (21.5 ft)

Width: 3.6 m (12 ft)

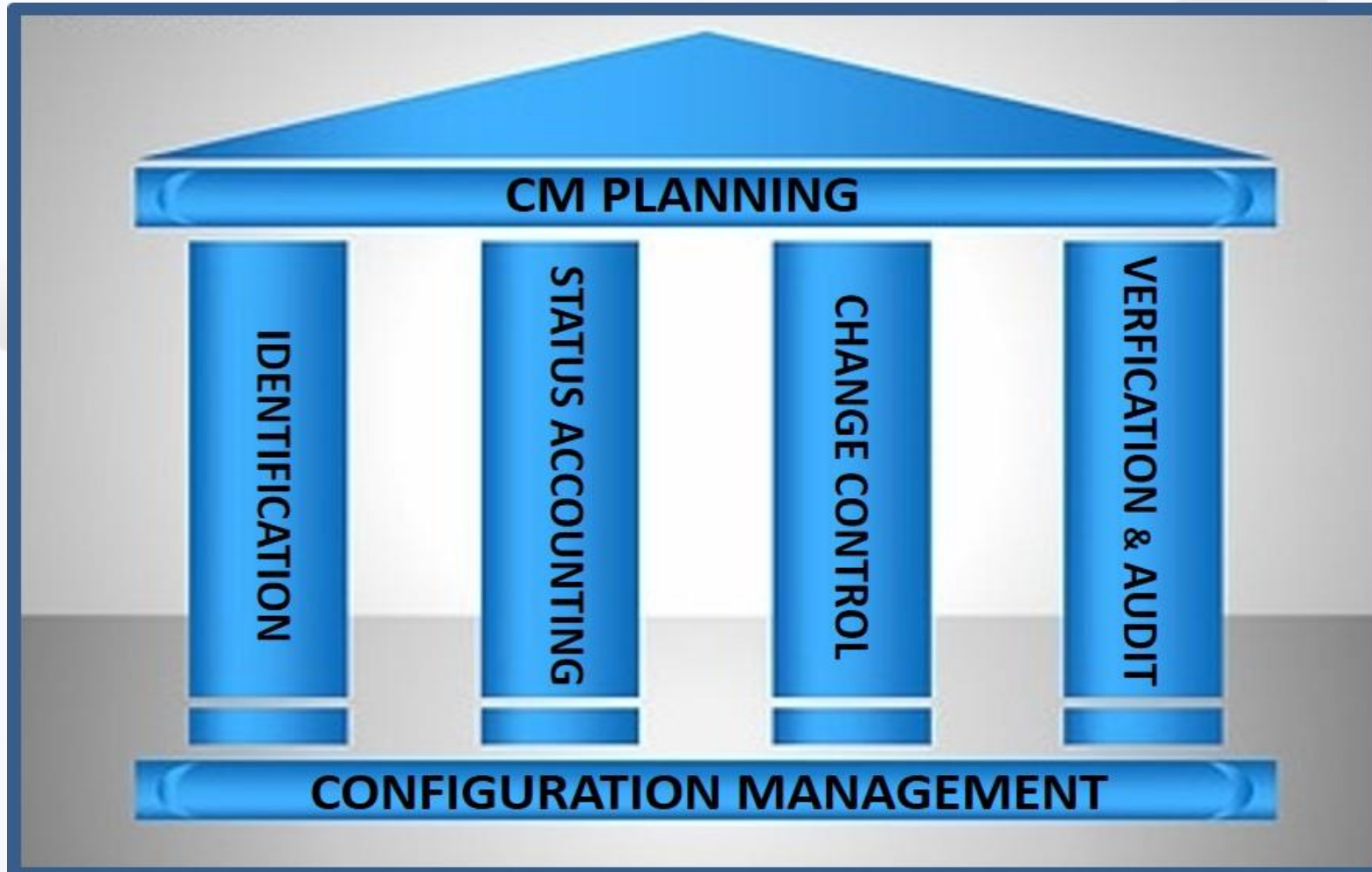
Height: 2.98m (9.8 ft)



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5 pillars of CM



For further
explanation, see
EIA-649C

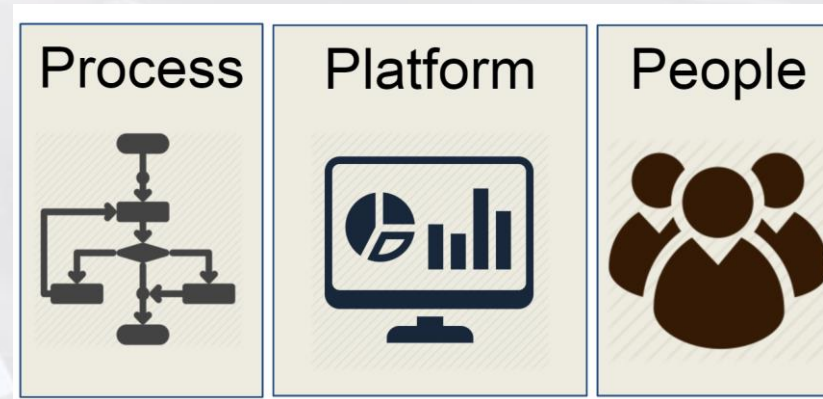
CM Planning

Planning Includes:

- Data Storage
- Numbering assignment systems
- User access to data
- Distribution and data protection
- CCB Charter and Authority
- Roles and Responsibilities
- Baselining, Design Review targets
- Training – basic, refresher, new employee, data consumer, data creator
- Metrics gathering and reporting
- Data Deliverables
- Sub-Contractor Management

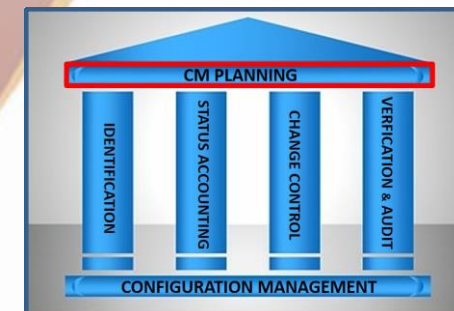
Planning Goals

- Define CM Processes and Procedures
- Designate Technology and System landscape
- Personnel resources and capabilities required for each task



CM Planning for Logistics

- Logistics input influences product design
- Access to reliable product data
- User account in CM database
- Membership in CCB and change review
- Clearly defined roles
- CM training to standardized processes and conventions



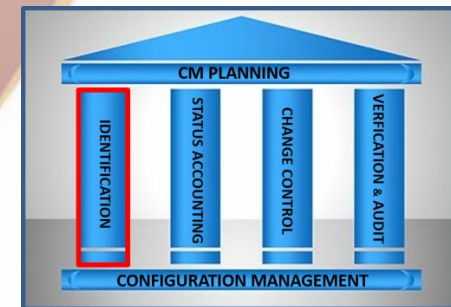
CM Identification

Areas of Identification

- Designating Configuration Items (CIs) and assigning a Configuration Item Identifier (CII)
- Assignment of Unique numbering to all record types
- Product Structure definition
- Baselining
- As-Installed/As-Fielded/As-X
- Assignment of discreet tracking numbers such as serial numbers

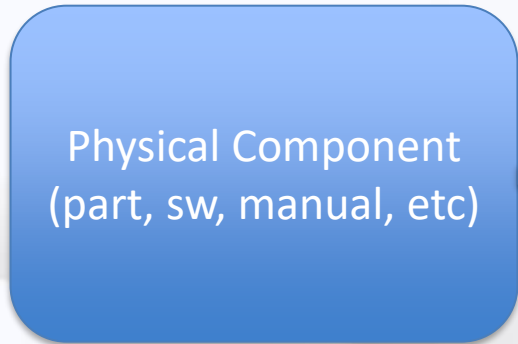
Identification Goals

- Completely defining the product including parent/child relationships
- Enable data retrieval and ability to tell one object from another of similar type
- Complete Identification so that future consumers of the data have all information needed to replicate the product



CM Identification Benefit to Logistics

Discreet Item



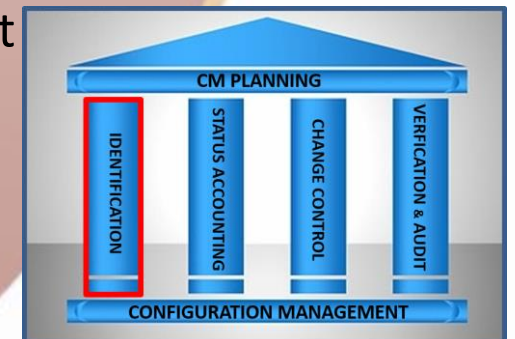
Must include component number PLUS company identifier.
IF traceability is required, it must also be uniquely identified by a 'serial number' or similar.

Design Data



Documentation of characteristics via model, specification, BOM, etc.

Design information (also called Product Configuration Information) Must include component number PLUS company identifier whether part is a Make, Buy, or Altered Item.



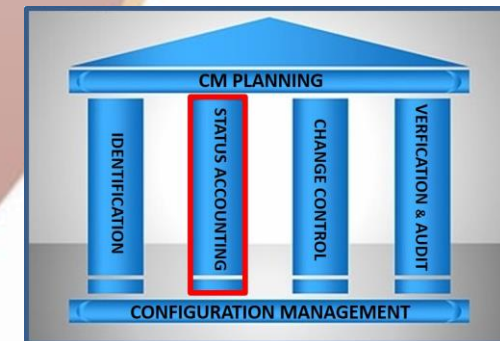
CM Status Accounting

Status Accounting Includes:

- Current state of all records and product data
- History of all versions of product data
- Visibility of and comparisons between the As-Designed and current As-X configurations
- Answers ‘research’ questions such as ‘what was the state of the design information at PDR, CDR,’ etc.

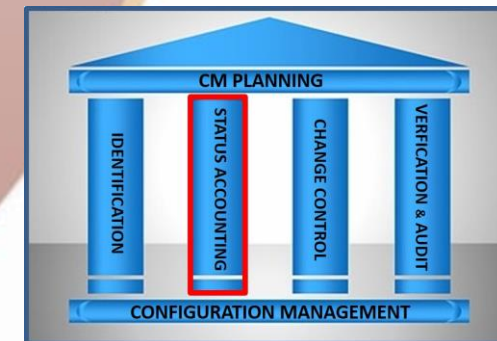
Status Accounting Goals:

- Right data, any time
- Baseline product data
- Reports
- Metrics outputs
- As-X Configurations

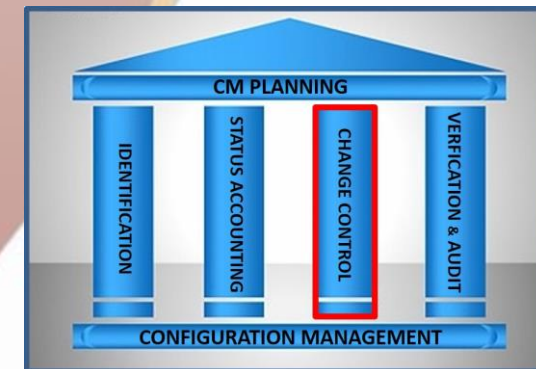
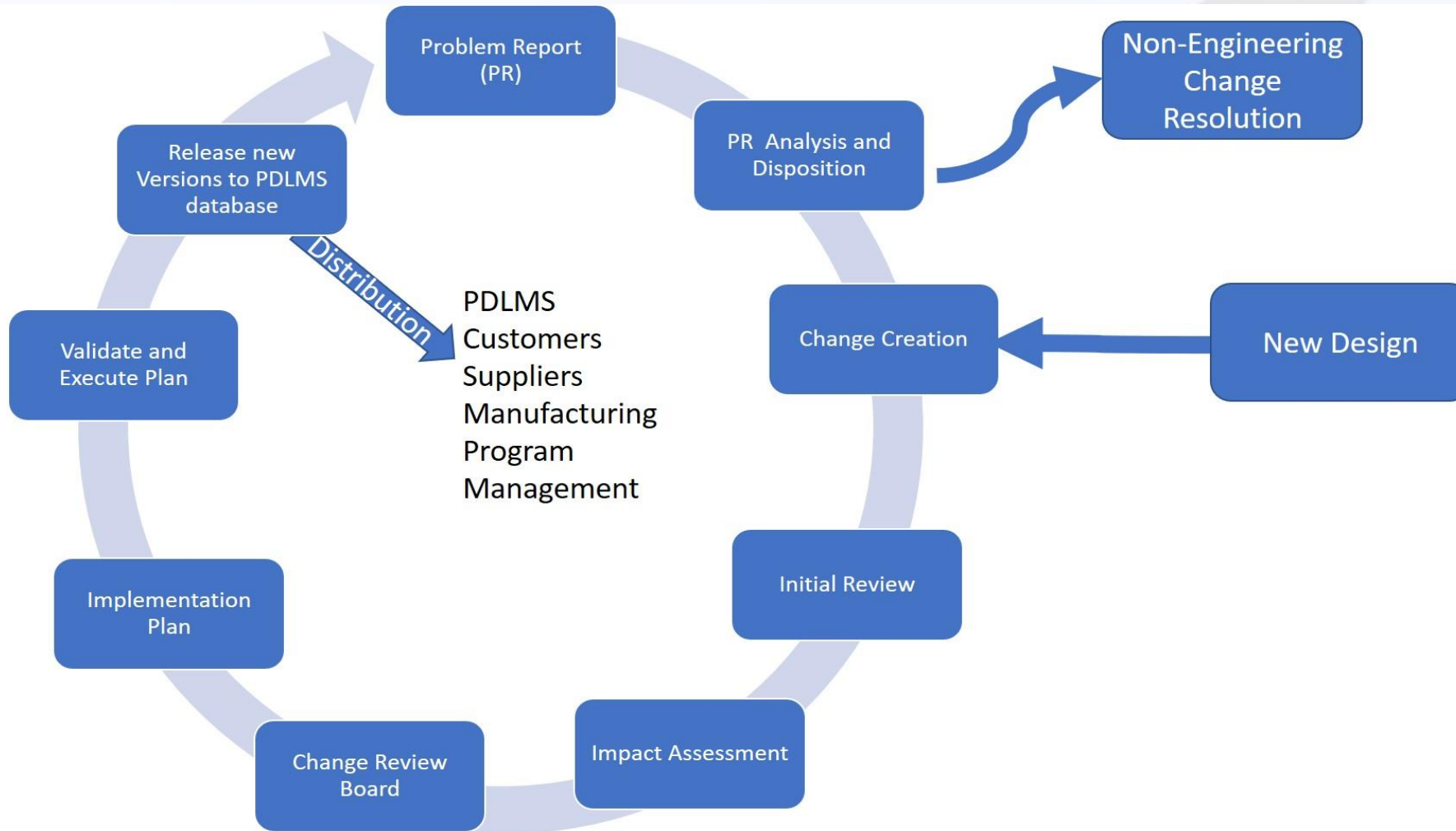


CM Status Accounting Benefits to Logistics

- Confidence in data
 - Latest approved revisions
 - Complete and accurate
 - timely
- Where-used queries
- Source for analysis
- Status of Audits and certifications



Change Management



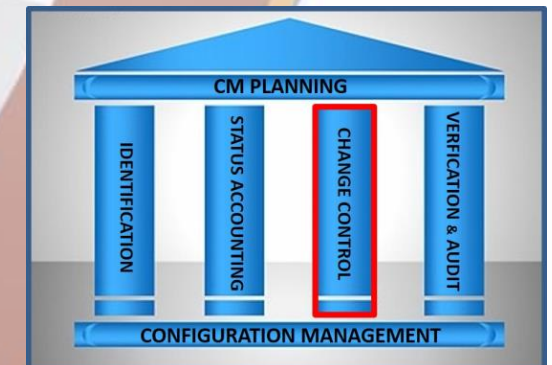
Change Management

Change Management Includes

- Documentation of change
- Thorough impact assessment
- Estimates of cost, materials, labor, schedule
- CCB Authorization
- Fast Track where possible

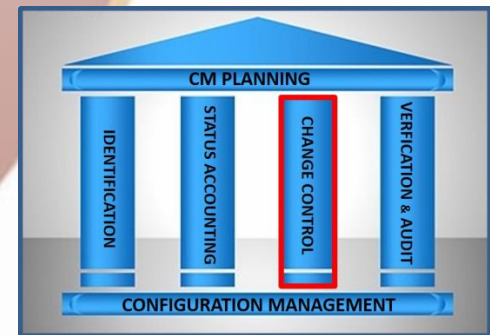
Change Management Goals

- Document ALL changes to product regardless of complexity
- Coordinate multiple changes to the same components
- Provide traceability/history/authorization



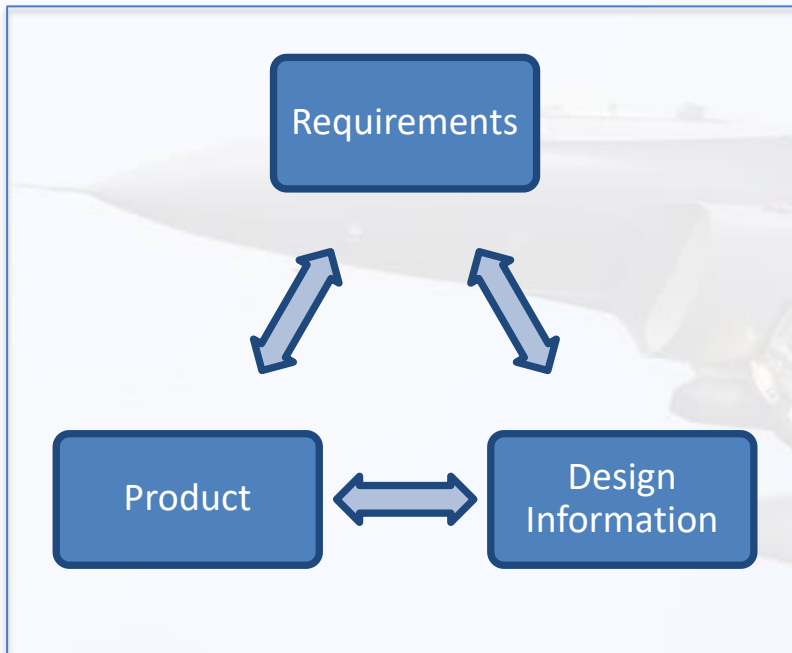
Making Changes work for Logistics

- Logistics should be on CCB
- Change implementation planning must take into account Logistics needs
 - Modification plan for in-service product
 - How to handle obsolescence of parts – updating both design information and availability of spares
- Keep changes open until change implementation into all in-service parts has been verified. Yes, this means that some changes will remain open for a long time, but will give greater visibility to how long the change implementation process is and that visibility will lead to better planning and more useful information for Logistics.

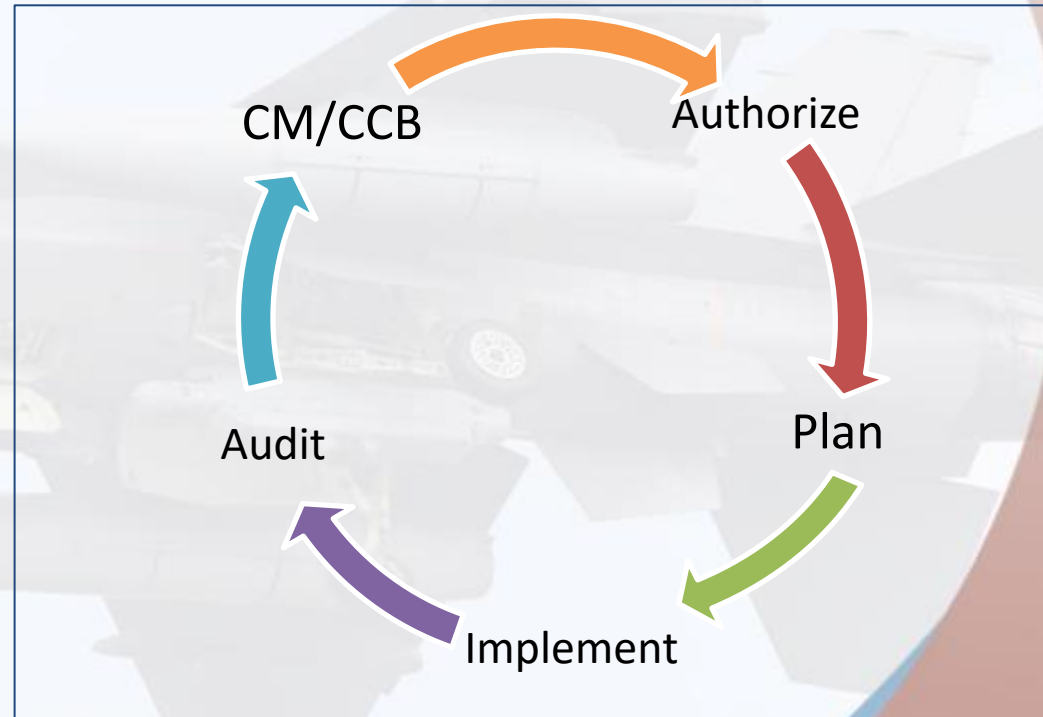


CM Verification and Audits

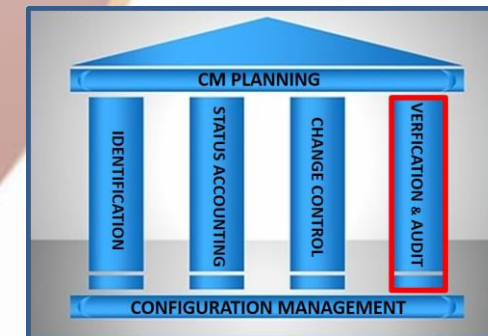
Verification and audits close the CM loops.



Product Verification

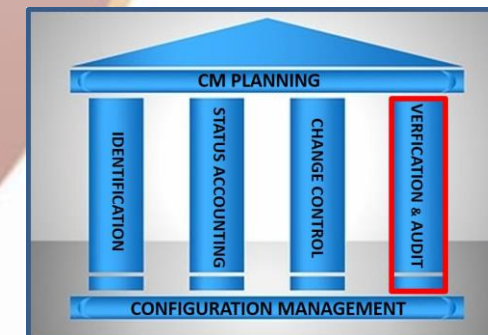


Change Verification



Verification and Audits benefits for Logistics

- Proper verification and audits will make Logistics tasks easier because the product will be what it is expected to be.
- Logistics is supported by records that the product was installed/created/shipped in agreement with all requirements – customer, regulatory, quality, etc.
- Product certifications, CofC, Authorization to Operate, etc. based on this information
- Change verification and audits cannot be completed until all products are modified/upgraded. This aids logistics tracking.



What are the As-X Configurations?

- As-Designed – the released Bill of Materials (BOM)
- As-Built – what is in the fabricated item including
 - variances
 - part substitutions
- As-Tested – what was tested plus
 - accounting for simulated items
- As-Shipped – what was delivered plus
 - any ship-short items that will be delivered and installed later
 - spares
- As-Delivered – the final configuration including any ship short items
- As-Fielded – includes items added and configuration settings completed by the customer
- As-Maintained – includes all
 - routine maintenance
 - subsystem or component replacements
 - Upgrades
 - Repairs
- As-Disposed – final disposition of the item and its components

Who cares about As-X?

CM

- Change
 - Impact analysis
 - Cost Estimating
 - Scheduling
 - Creation of mod kits, etc.
 - Implementation plan
 - Structure of Audits
- Engineering investigations

Logistics

- Maintenance tasks
 - Proper equipment
 - Availability of repair/overhaul/upgrade components and instructions
 - Scheduling
 - Justification/Authorization of modifications

Back to Scenario #2

Scenario #2

- MRO program with little to no access to OEM data
- CM still helpful because reverse-engineering and/or auditing is necessary to define a starting baseline
- Logistics will inform design definition of product from this point forward
- CM and Logistics together will define and create needed product information to complete the work and establish traceability
- As-Planned as well as As-X configurations will be created

Summary

- Better understanding of basic elements of CM
- CM practices support Logistics Engineering needs throughout the product lifecycle and vice versa in a symbiotic relationship
- Being able to include Logistics needs from the start is ideal but can be overcome if necessary
- Having a PLM system is not a guarantee of having good CM – people, processes, and technology must work together.
- Logistics engineering is made easier when backed up by ‘good’ CM

Thank You

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