

# Introduction to FAA Configuration Management

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Federal Aviation  
Administration



# Overview

- What is CM?
- Configuration Management Tenets
- What are the Benefits?
- Why Is CM Important?
- CM in the FAA
- FAA Acquisition Management System (AMS)
- CM Policy
- CM Responsibilities
- Decision Authority
- NCP Process
- CM Automation



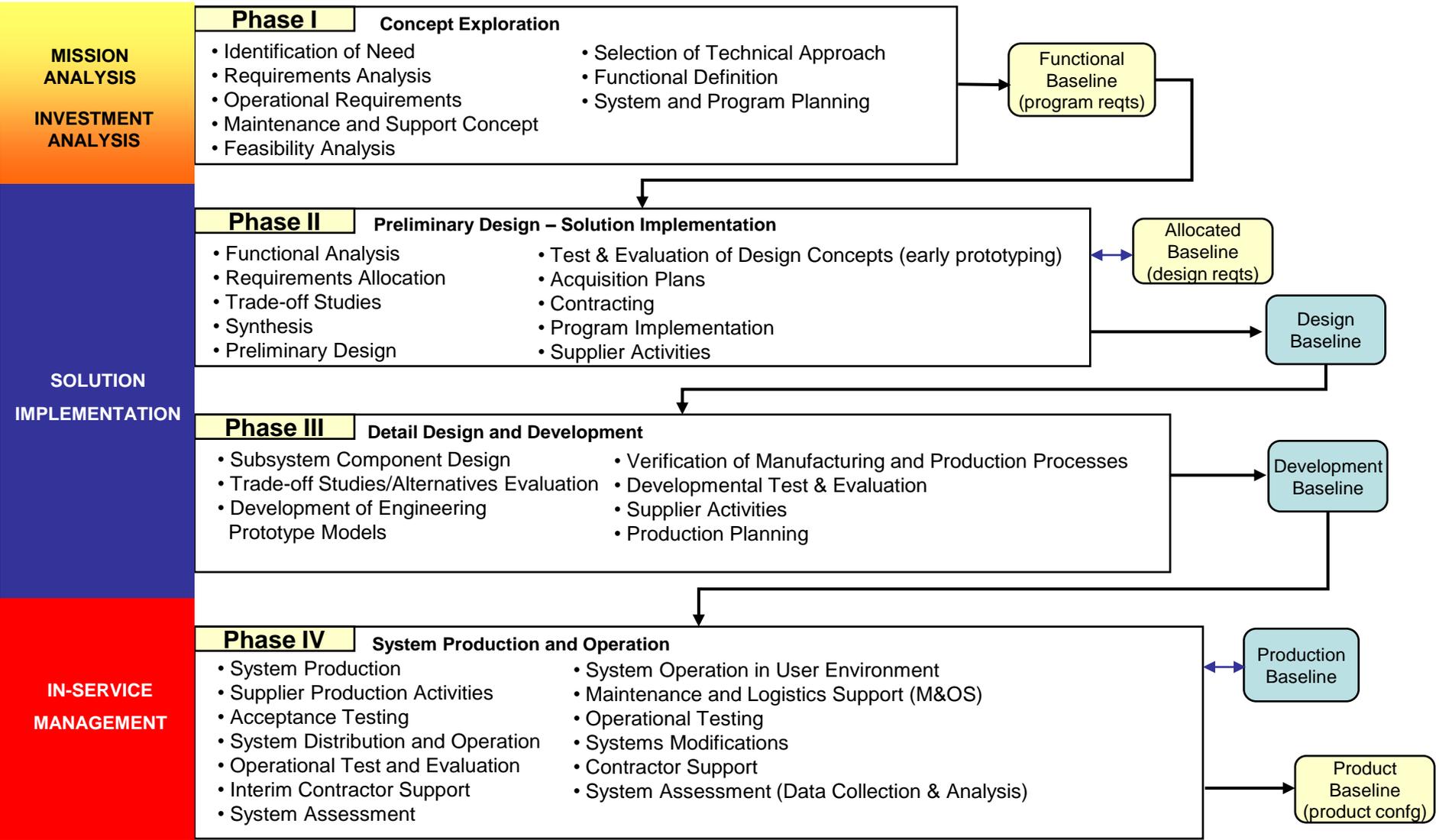
# What Is CM?

- Configuration management is a management 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. *(as defined in MIL-HDBK-61)*
- There are 5 basic CM principles
  - CM Planning and Management
  - Configuration Identification
  - Configuration Control
  - Configuration Status Accounting
  - Configuration Audits and Assessments
- **These principles also apply to**
  - Information/data management

# Definitions

- **Configuration Management and Planning** *(as defined in MIL-HDBK-61)*
  - Management activities including planning for and selecting key actions to implement and measure the effectiveness of configuration identification, control, status accounting and audit, throughout the program lifecycle. Configuration Identification.
- **Activities**
  - Preparing for each life-cycle phase (resources, personnel, tools, facilities, systems compatibility, etc.)
  - Implementing Government CM process
  - Measuring/evaluating Government and vendor CM processes and performance
  - Effecting process improvements
  - Documenting lessons learned
  - Interface management
  - Vendor selection/control: COTS/equipment

# Product Lifecycle Phases and Baselines



# Definitions *(continued)*

- **Configuration Identification** *(as defined in MIL-HDBK-61)*
  - (1) The systematic process of selecting the product attributes, organizing associated information about the attributes, and stating the attributes.
  - (2) Unique identifiers for a product and its configuration documents.
  - (3) The configuration management activity that encompasses the selection of CIs; the determination of the types of configuration documentation required for each CI; the issuance of numbers and other identifiers affixed to the CIs and to the technical documentation that defines the CI's configuration; the release of CIs and their associated configuration documentation; and the establishment of configuration baselines for CIs.
- **Activities**
  - Selecting/defining configuration items
    - Configuration item: an aggregate of hardware or software that satisfies an end-use function
  - Generating parts/items identifiers
    - Consistent nomenclature
    - Reflects relative arrangement of parts
  - Generating releases
    - Release: a designating activity that verifies that documents, hardware, drawings, and/or code is complete and suitable for use
  - Providing media identification
  - Freezing baselines
    - Baseline: a collection of formal configuration documentation
    - Typical baselines include: Functional, Allocated, Developmental, and Product Baselines

# Definitions *(continued)*

- **Configuration Control** *(as defined in MIL-HDBK-61)*
  - (1) A systematic process that ensures that changes to released configuration documentation are properly identified, documented, evaluated for impact, approved by an appropriate level of authority, incorporated, and verified.
  - (2) The configuration management activity concerning: the systematic proposal, justification, evaluation, coordination, and disposition of proposed changes; and the implementation of all approved and released changes into (a) the applicable configurations of a product, (b) associated product information, and (c) supporting and interfacing products and their associated product information.
- **Activities**
  - Processing changes to baselines/releases
    - Change classification
    - Change approval/disapproval
    - Change prioritization
  - Mechanisms for initiating changes include NAS Change Proposals (NCPs), Engineering Change Proposals (ECPs), Notices of Revision (NORs), variances, etc.
  - Organizing/managing configuration control boards (CCBs)
    - Authority
    - Membership
    - Charter
    - Operating Procedures

# Definitions *(continued)*

- **Configuration Status Accounting** *(as defined in MIL-HDBK-61)*
  - The configuration management activity concerning capture and storage of, and access to, configuration information needed to manage products and product information effectively.
- **Activities**
  - Information recording
    - Approved configuration documentation
    - Proposed changes: NAS Change Proposals (NCPs)
    - Deviations
    - Results of configuration audits
    - Status of authorized changes
    - Meeting minutes (CCBs, etc.)
    - Other documents
  - Information maintenance
  - Data dissemination
  - Metrics

# Definitions *(continued)*

- **Configuration Audits and Verification**
  - A product's requirements have been met through conduct of formal functional and physical configuration audits.
  - The product design meeting those requirements are accurately documented before a product configuration is baselined.
  - Operational systems are periodically validated to ensure consistency between a product and its current baseline documentation. Verification of the incorporation of modifications is a critical function of this activity. This validation includes verification of facility baselines and conduct of system audits after commissioning.
- **Activities**
  - Audit planning
  - In-process (internal) audits
  - Functional Configuration Audit (FCA): verifies that a configuration item has achieved the requirements specified in its functional and allocated configuration documentation
  - Physical Configuration Audit (PCA): verifies the “as-built” configuration of a configuration item against its technical documentation; establishes the configuration item's product baseline
  - Re-baselining audits
  - Audit reporting

# Definitions *(concluded)*

- **Information/Data Management**

- Application of configuration management principles to ensure the integrity of digital representations of product information and other data.
- Management of data relative to all shareable FAA information used to perform the FAA mission. (Reference FAA Order 1375.1, Information/Data Management Policy).

- **Activities**

- Standard data formats
- File identification
- Disks/tapes
  - Identification/labeling
  - Information validation
  - Backups
- Version control
- Data transmittal
- Access control
- Platform control
- Data retention/archival

# Configuration Management Tenets

## FAA CM

### CM Planning & Management

- CM Policy & Procedures
- Enterprise CM CMPP
- CCB Charters & Operating Procedures
- CM Advisory Team
- CM Plans

### Configuration Identification

- Establish Baselines
  - Developmental
  - Functional
  - Allocated
  - Product
  - Operational

### Configuration Control

- Identify Need
- Describe Change
- Coordinate and Review
- Disposition Change
- Implement Change
- Monitor Implementation
- Capture Change Data

### Configuration Status Accounting

- Capture Vendor Change Vehicle (PTR/HDR/ECP) Status
- Capture CF/NCP/CCD Status
- Capture Change Release (SSD, STB) Status
- Capture Associated Baseline Status

### Configuration Audits

- Monitoring and Oversight
  - Agency CM Operations
  - Contractor CM
- Manage & Verify
  - Internal Audits
  - FCA/PCA
  - Baselines

### Information/Data Management

**Secure Storage of and Accessibility to Digital Data. Includes Configuration Data and Related Program Information such as:**

- Documents • Drawings • SW Code • Change Data • Plans

# What are the Benefits?

- **CM enables**
  - safety
  - information security
  - greater cost control
  - better decision-making
  - data accessibility and integrity
  - product supportability
  - process improvement
  - performance metrics
- **CM supports key objectives of the FAA enterprise architecture**
- **CM supports application of consistent best practices across the agency**



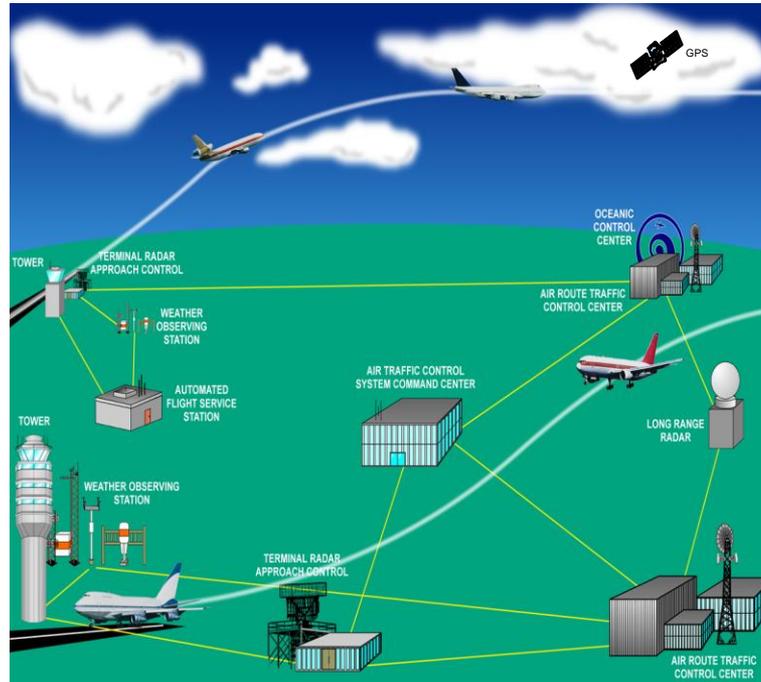
# Why Is CM Important? – Examples

Shortfalls	Problems	Benefits
<ul style="list-style-type: none"> <li>• Repeated site surveys</li> </ul>	<ul style="list-style-type: none"> <li>• Inaccessible or unreliable system and site information</li> </ul>	<ul style="list-style-type: none"> <li>• Accessible data</li> <li>• High-level of confidence in product information</li> <li>• Cost/schedule savings</li> </ul>
<ul style="list-style-type: none"> <li>• “Go Back” teams</li> </ul>	<ul style="list-style-type: none"> <li>• Inaccessible/unreliable system and site information</li> <li>• Uninstalled modifications</li> </ul>	<ul style="list-style-type: none"> <li>• Accessible data</li> <li>• High-level of confidence in product information</li> <li>• Cost/schedule savings</li> <li>• Supportability</li> </ul>
<ul style="list-style-type: none"> <li>• Unsupportable operational systems</li> </ul>	<ul style="list-style-type: none"> <li>• Variations in site configurations &amp; products</li> <li>• Uninstalled modifications</li> <li>• Unreported changes</li> </ul>	<ul style="list-style-type: none"> <li>• Proper replacement and repair</li> <li>• Decreased delays, product down-time and maintenance cost</li> </ul>
<ul style="list-style-type: none"> <li>• Safety Risk</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of CM procedures</li> <li>• Unauthorized change</li> <li>• Undocumented system configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Controlled changes</li> <li>• High-level of confidence in product information</li> </ul>
<ul style="list-style-type: none"> <li>• Requirements creep</li> </ul>	<ul style="list-style-type: none"> <li>• Loosely managed technical requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Controlled changes</li> <li>• Cost/schedule savings</li> </ul>

# CM in the FAA

## Configuration Management

- Essential for effective evolution and operation of the NAS and overall IT infrastructure of the FAA
- Cornerstone of good programs
- Process to maintain traceability from requirements through acquisition to operational systems

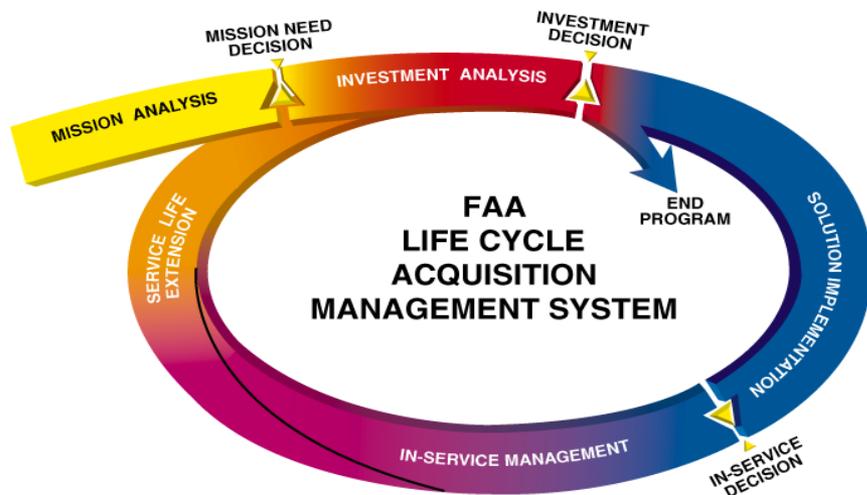


## Enterprise CM

- Provides overall infrastructure
- Works with the Service Areas/Regions to support their ability to build and deliver systems
- Works with the FAA EA personnel so that systems can be effectively integrated, operated and maintained.

# Acquisition Management System (AMS)

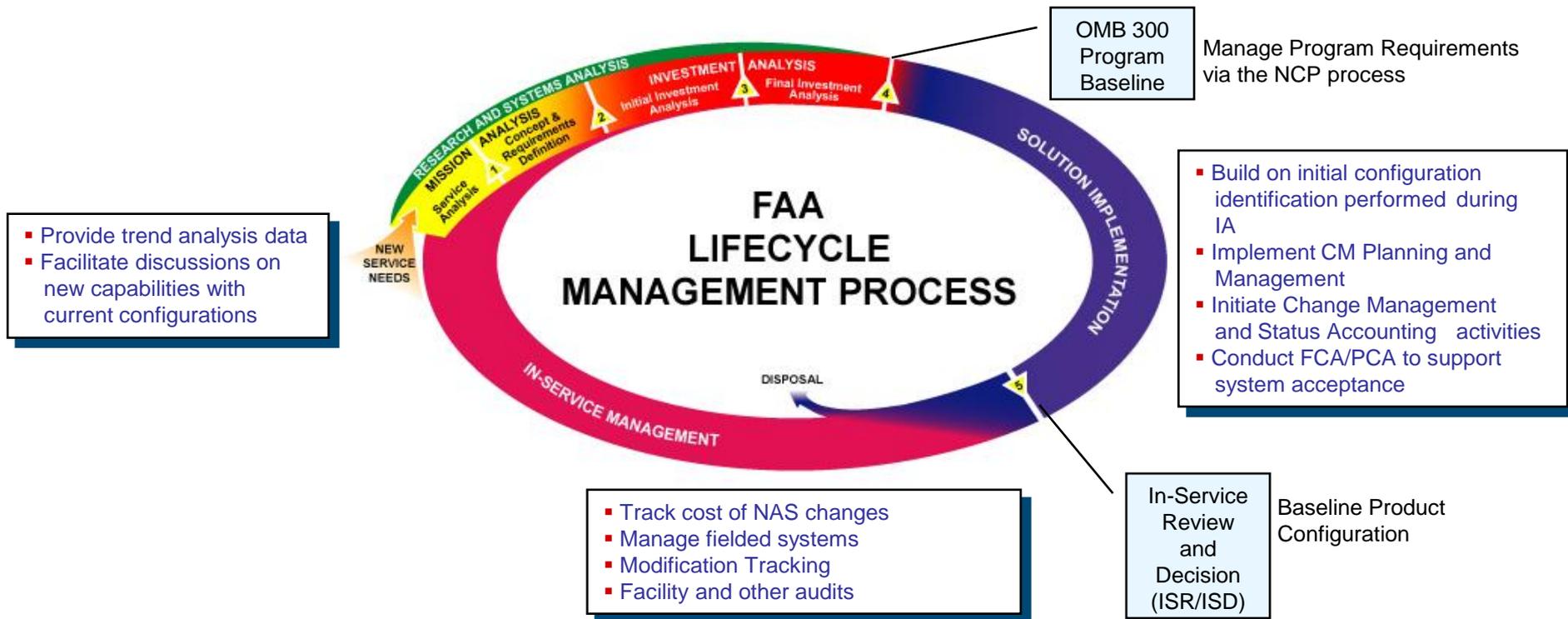
## The Law for FAA Acquisition Management



- FAA lifecycle policy for FAA procurements
- The FAA Acquisition Executive, currently the Vice President of Acquisition and Business Services, is the decision authority
- The Joint Resources Council is the governing decision body
  - Convenes to make corporate decisions on mission need, acquisition investments, and acquisition program baseline changes – approves Exhibit 300 submissions (Final Program Requirements, Implementation Strategy and Plan, Business Case Analysis Report)
  - Reviews and recommends approval of agency's budget submissions
  - Approves the FAA Enterprise Architecture baseline
  - Charters top-level Configuration Control Boards

# AMS and Configuration Management

- Ensure CM requirements and resources for the life cycle are allocated



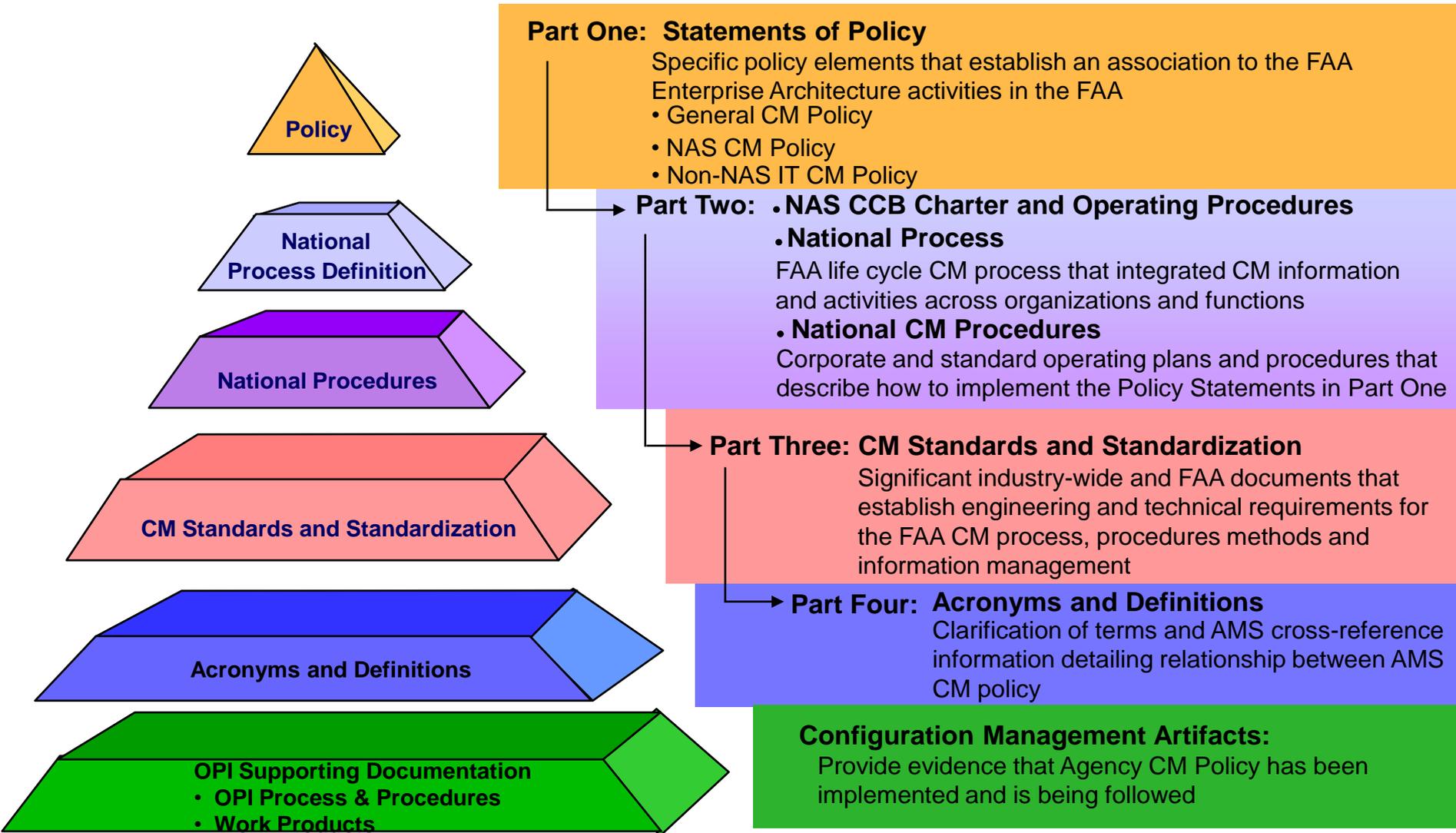
*CM Policy Is An Important Element within AMS*

# Configuration Management Policy

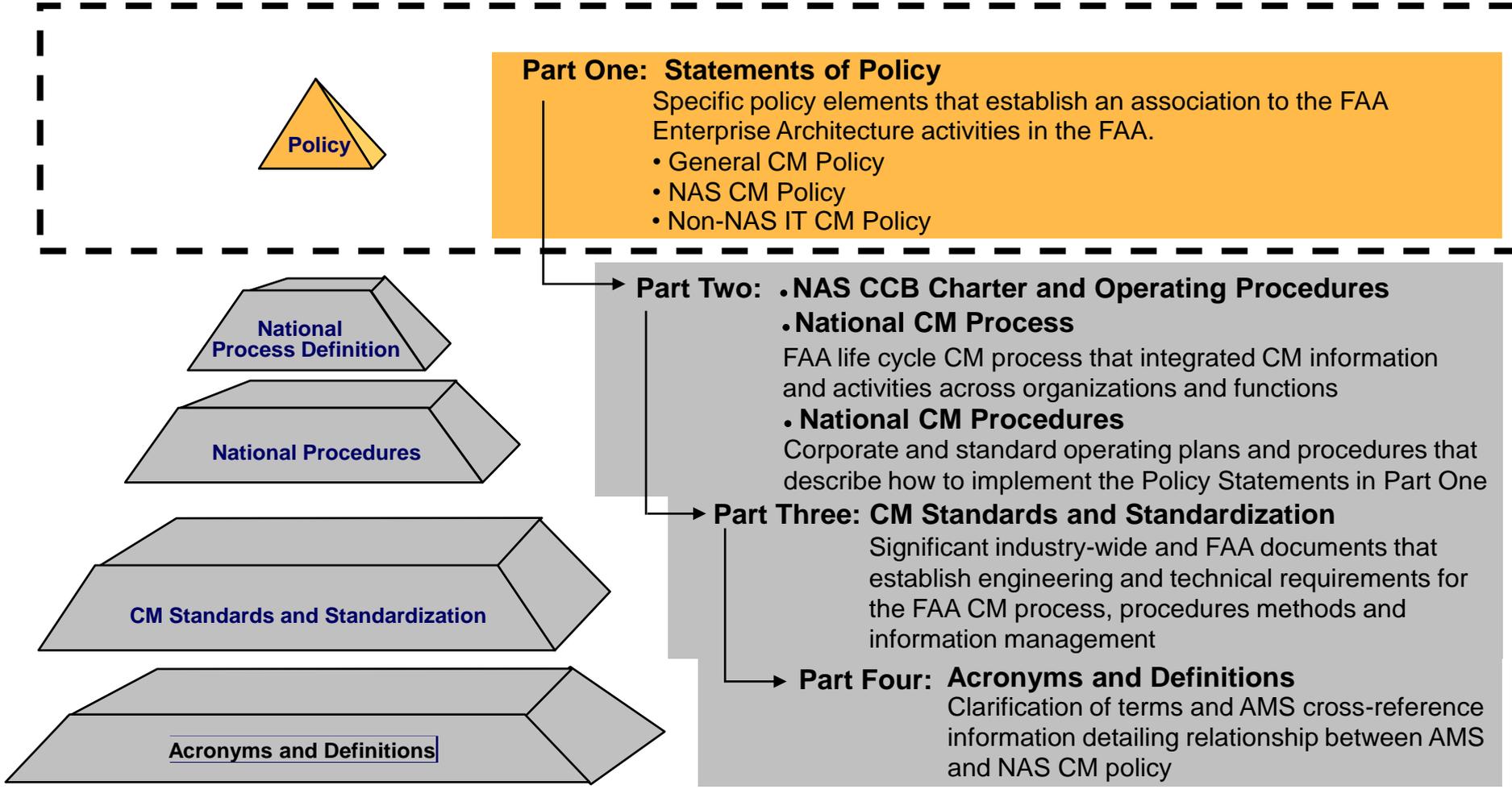
- **FAA Order 1800.66 prescribes configuration management policy and practices for the Agency**
- **AMS also requires application of CM and includes links to the order**
- **Applies to the NAS and to Non-NAS IT**
  - Requirements
  - Interfaces
  - HW and SW
  - Facility Configurations
  - Technical Documentation
- **Provides Full Life Cycle Policy, Procedures, and Processes**
- **Was developed using government and industry best practices and lessons learned**



# FAA Order 1800.66



# FAA Order 1800.66 Change 2 - Scope



# Roles and Responsibilities

**The roles and responsibilities for implementing Configuration Management in the FAA are:**

- **Joint Resources Council (JRC)**
  - Charter NAS and Non-NAS IT CCBs. This responsibility is delegated to the ATO Executive Council for the NAS and Information Technology Executive Board for Non-NAS IT
- **VP of Technical Operations. Serves as the FAA Configuration Management Authority**
  - Oversee CM activities for the Agency
  - Track and report the state of agency CM to executive management
  - Support integration of the configuration management requirements into related processes (e.g., AMS, SMS...)
  - Provide CM training and guidance

# Roles and Responsibilities *(continued)*

- **All FAA lines of business and staff offices:**
  - Perform configuration management in accordance with 1800.66
  - Ensure configuration management traceability of their assets and investments to the FAA EA
  - Submit change proposals to baseline JRC approved final program requirements (FPR) to the NAS or Non-NAS IT CCBs, as appropriate
  - Ensure that operational assets, systems and programs not identified in the FAA EA are captured in the appropriate CM baselines and the FAA EA



# Enterprise CM Responsibilities

- **Agency Configuration Management Planning and Implementation**
- **Agency CM Policy, Procedures, and Guidance**
- **Agency CM Monitoring and Oversight**
- **NAS Configuration Control Board (CCB) Operations**
- **CM Information Management (Automation)**
- **Documentation Control Center (DCC)**
- **Executive and Practitioner Sponsorship**
- **CM Training, Awareness, Outreach, and Communication**
- **CM Related Agency Support**
  - JRC, ATO EC, ITEB Advisory role
  - Safety Management System
  - Agency Information System Security
  - Agency System Engineering Manual
  - Data Release Review Committee (DRRC) Implementation and Operations
  - Non-NAS IT CM Program

# FAA Configuration Management Baseline Relationships View

## Programmatic Baselines

### Baseline Responsibility:

- OMB Exhibits 300
- Enterprise Architecture
- F&E Budget
- Data Standards
- Technology Standards
- NAS and Non-NAS CCB Charters

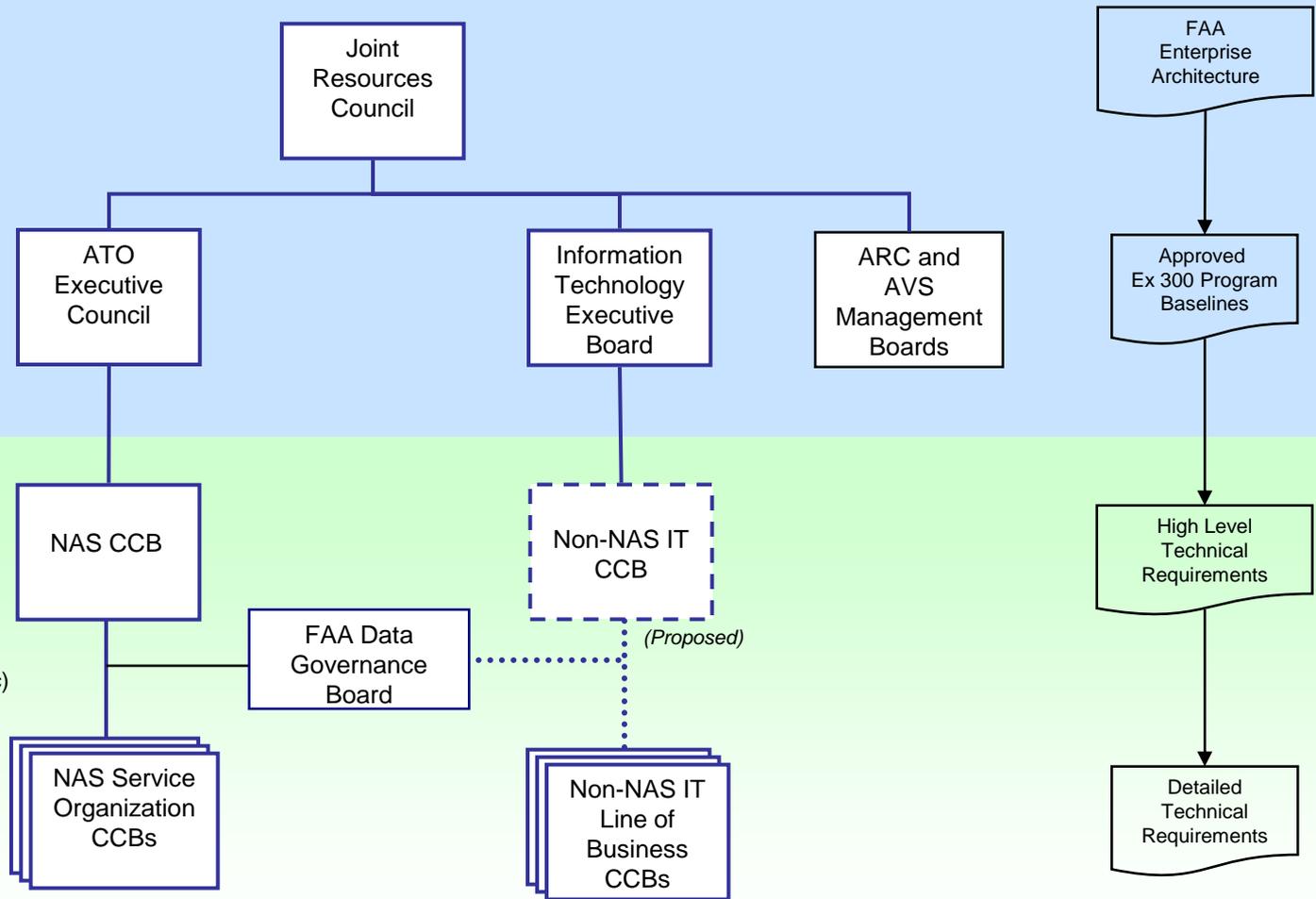
## Technical Baselines

### Baseline Responsibility:

- Final Program Requirements
- Top Level Requirements
- Interface Requirements
- External Interfaces
- Master Configuration Index
- Unallocated CIs
- FAA Standards (NAS CCB specific)
- Subordinate CCB Charters

### Baseline Responsibility:

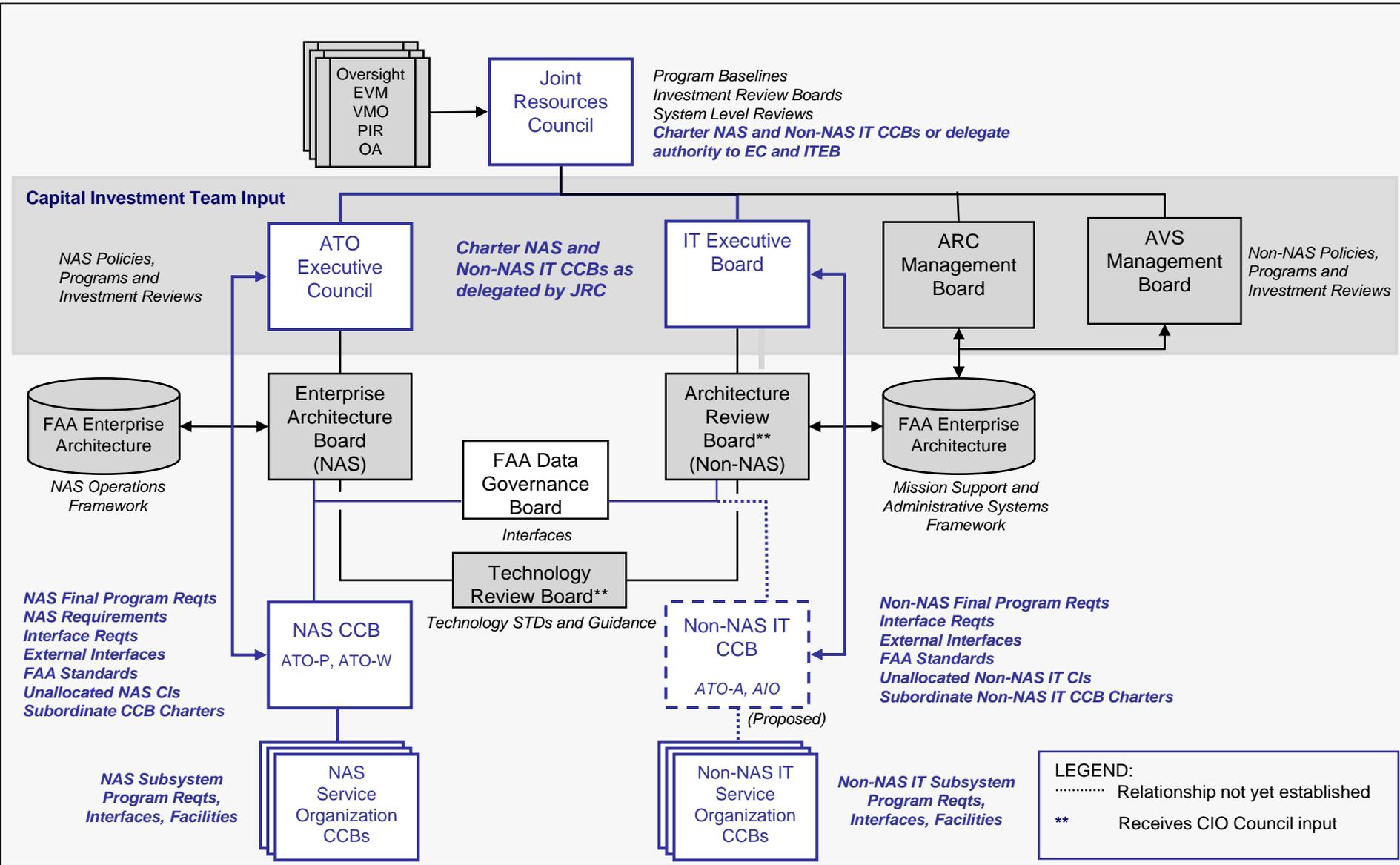
- Programs
- Interfaces
- Facilities



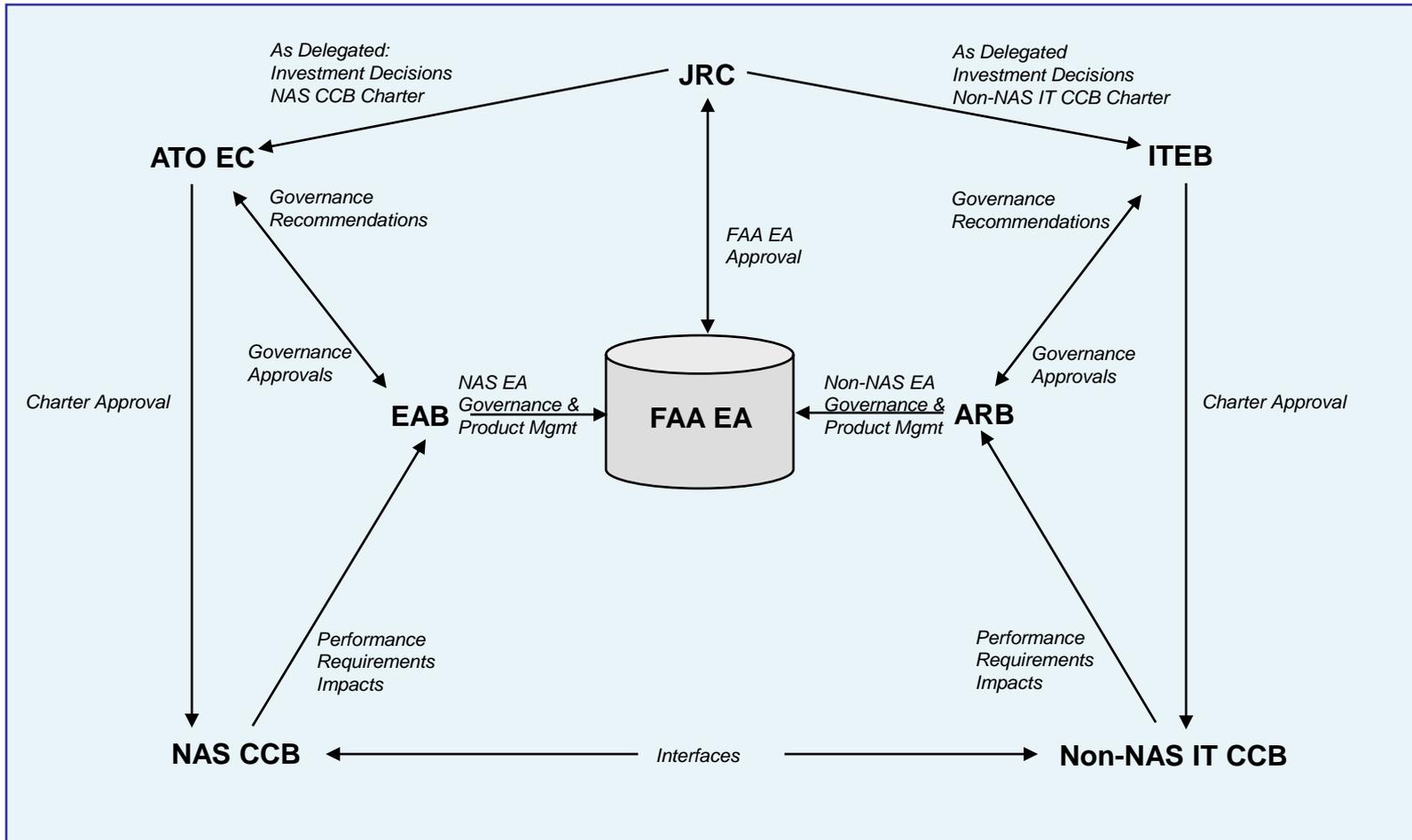
..... Dotted line indicates existing relationship needing further definition

**CM Program Drivers:** • Acquisition Management System • FAA Order 1800.66 • Enterprise Architecture • FAA iCMM • CM Plans • Charters & Operating Procedures

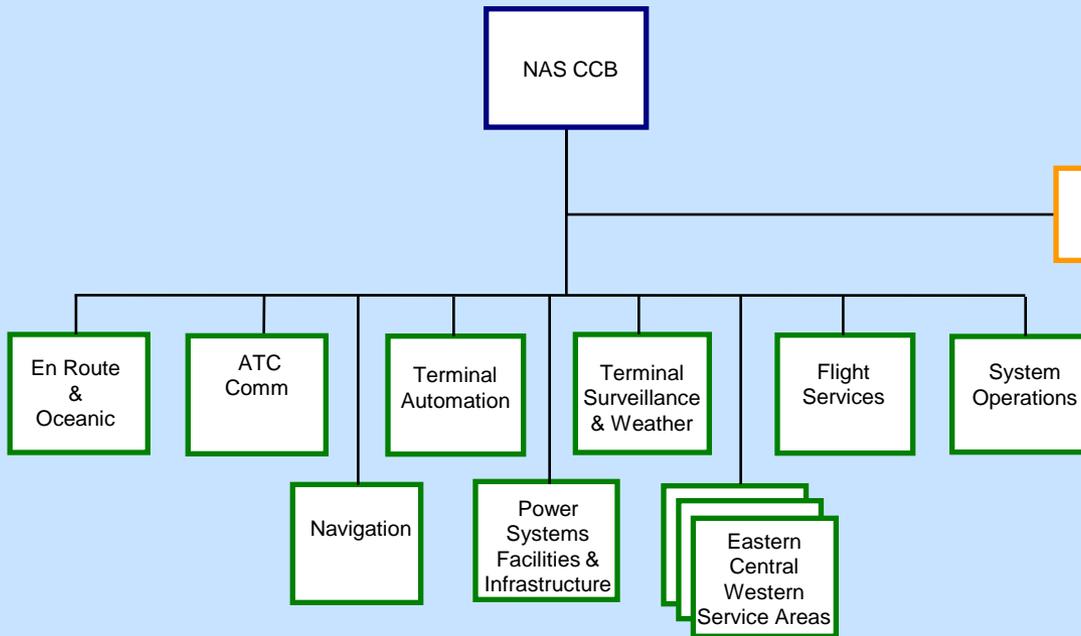
# FAA Decision Structure Detail for CM



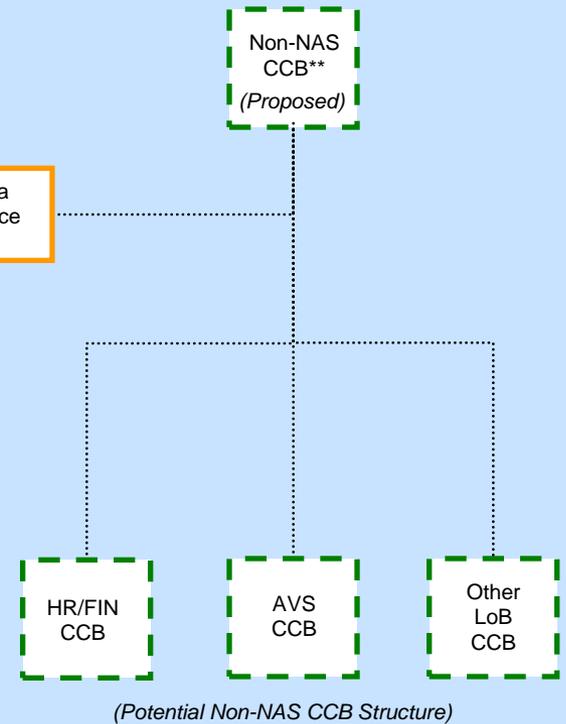
# Data Relationships



# FAA Configuration Control Board Structure



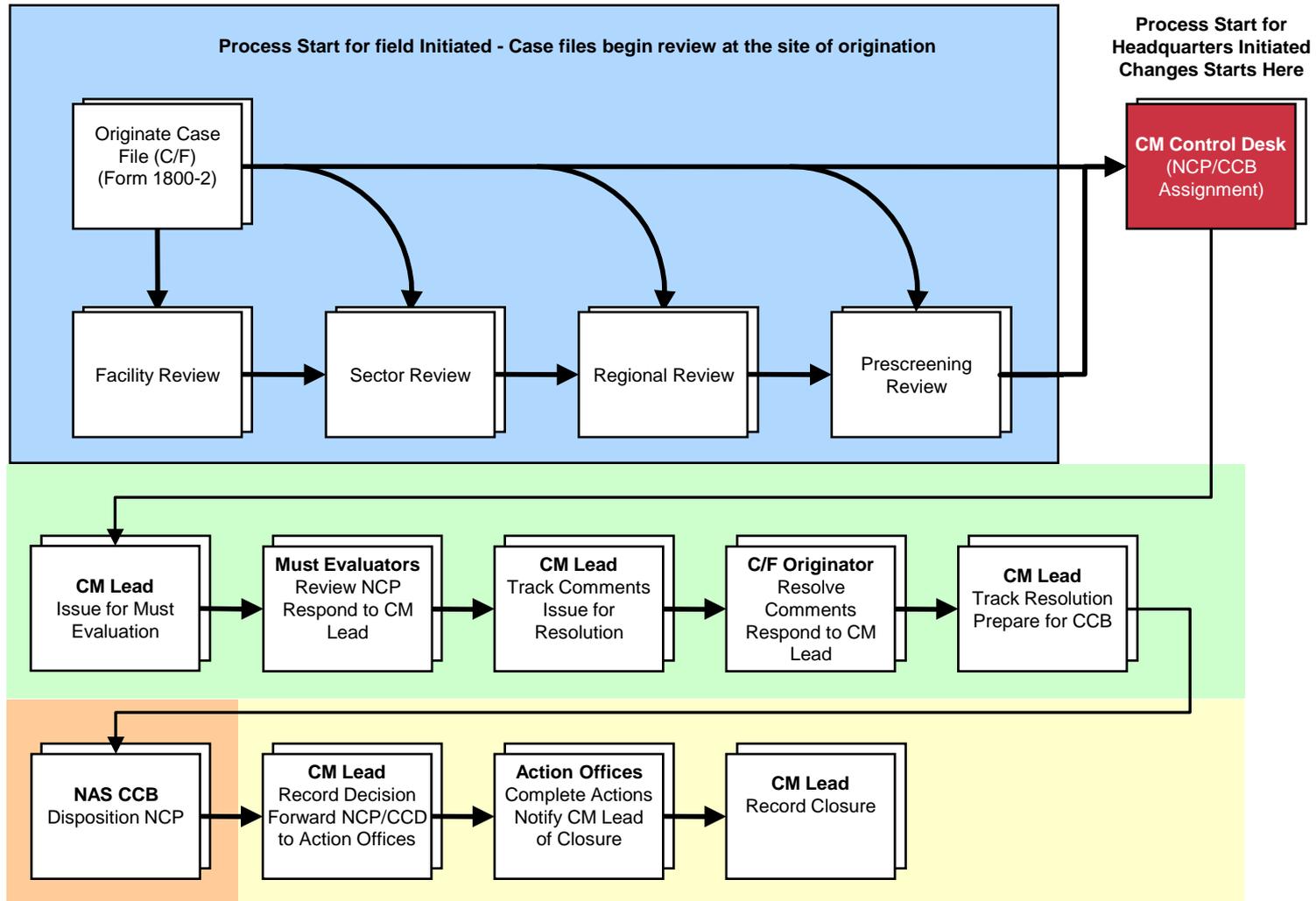
NAS CCB Structure Revised June 22, 2007



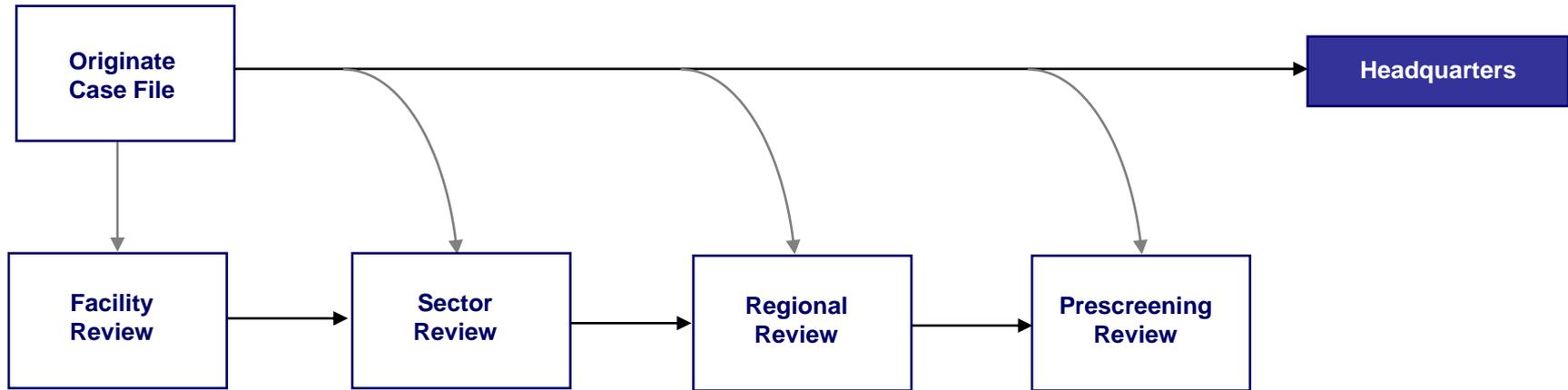
\*\* Propose promotion of NAS Support CCB, originally chartered by the NAS CCB, to fulfill this function

DRAFT Non-NAS CCB Structure as of January 2007

# NAS Change Process



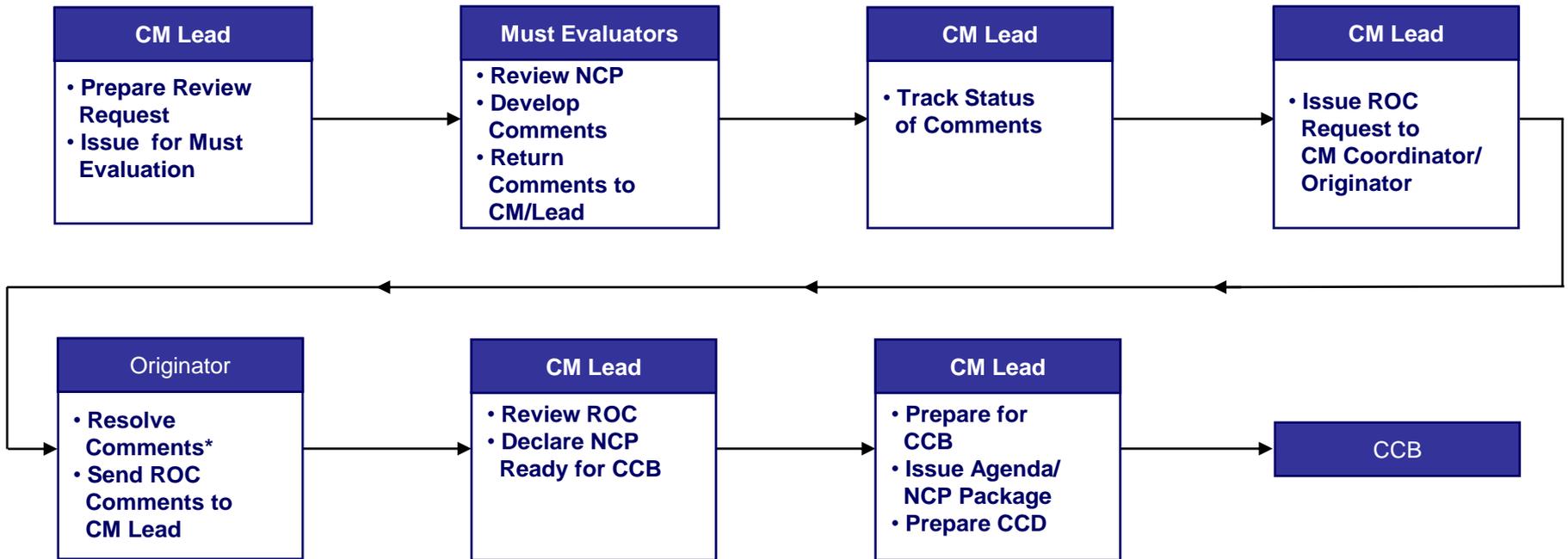
# Case File Processing



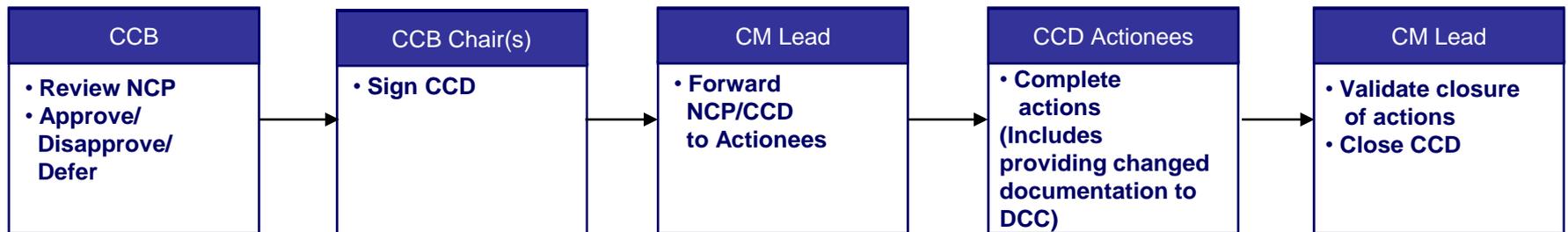
# Control Desk Processing



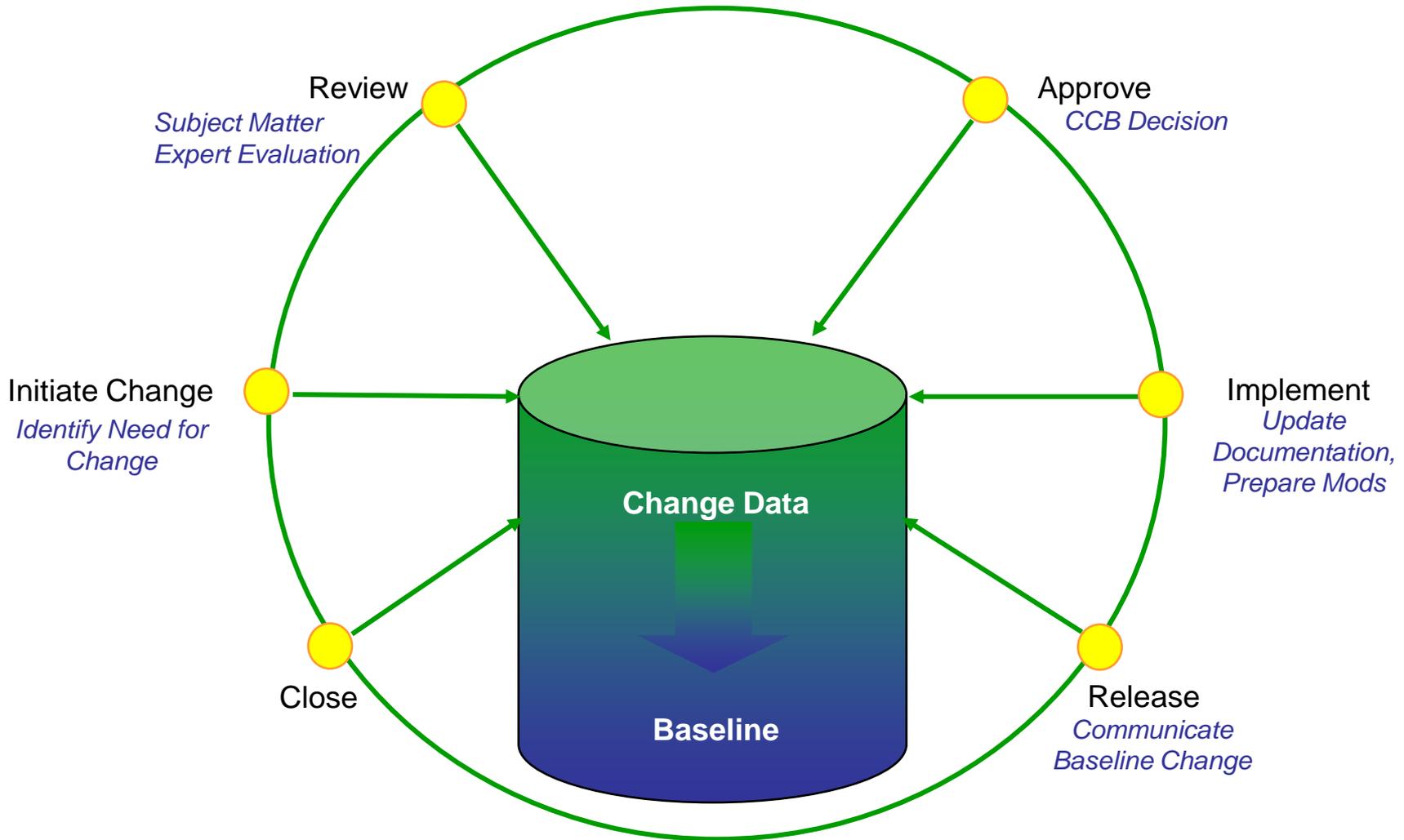
# NCP Processing



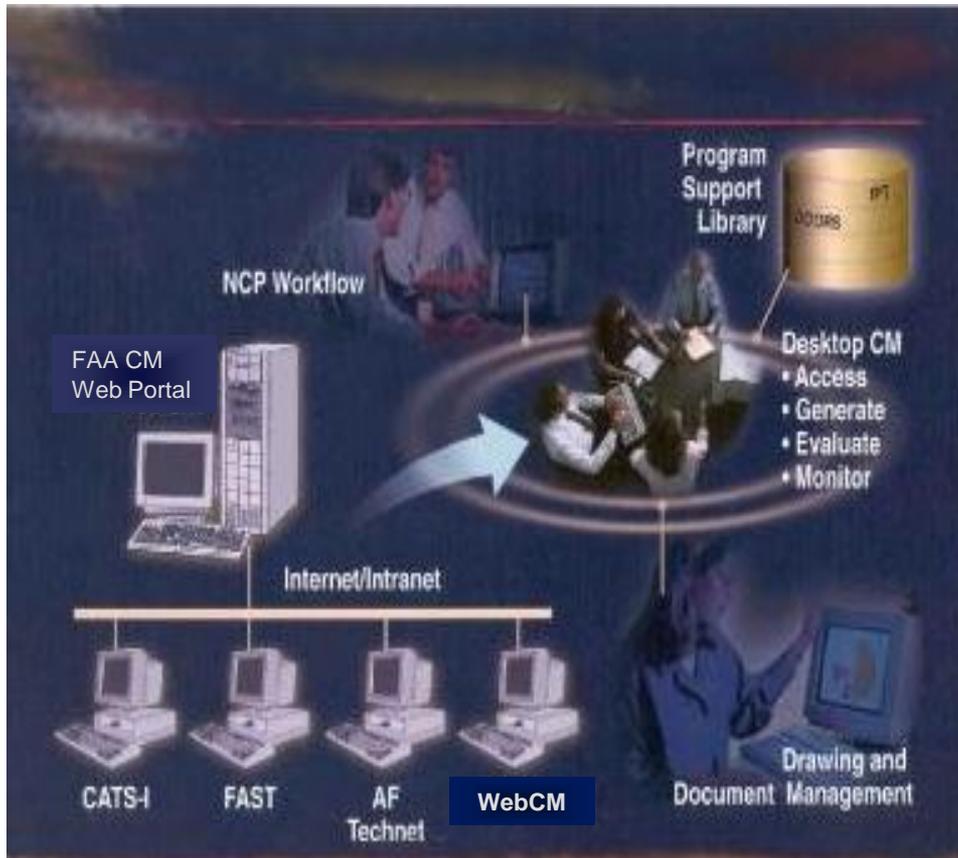
# CCD Processing and Closure



# Closed Loop Process



# CM Automation – Concept of Operations



## Core Components

- Case File/NCP/CCD Processing - WebCM
- CM Data Repository & DOCCON Replacement
- Virtual Document Control Center & PSLs
- CM Web Portal

## Features/Benefits

- Secured, reliable access to CM information
- Reduced redundancy
- More integrated resources
- Gain information management efficiencies
- Union/ISS Certification, Section 508 Compliant
- Web-based application

More accurate and reliable information to support operations and decision-making

# WebCM

- **WebCM is the national automated CM support tool**
  - Automates the NAS change process
  - Interfaces with DOCCON, where Master Configuration Index resides.
- **WebCM is the official vehicle for initiating changes to the NAS**

# MCI/DOCCON

- **The Master Configuration Index (MCI) reflects the “as is” detail for the NAS**
- **It provides a snapshot of the current NAS baseline, allowing the FAA to assess progress towards the future NAS**
- **The future NAS is captured in the NAS Enterprise Architecture**
- **The MCI is maintained by the Enterprise CM organization (Documentation Control Center – DCC)**
- **MCI captures data output from the change process:**
  - Configuration items
  - Approved, baseline documents
  - Relationships between CIs, documents, change decisions and change releases

# Contacts

- **Enterprise Configuration Management**
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[denise.dunlap@baesystems.com](mailto:denise.dunlap@baesystems.com)
  - Help Desk 1-877-248-HELP (4357)
- **DOCCON**
  - Bob Payne, Application Manager (202) 548-5596  
[robert.e.payne@baesystems.com](mailto:robert.e.payne@baesystems.com)

# Useful Web Pages

- Agency CM Website: [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/techops/cm/](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/cm/)
- Agency CM Policy: [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/techops/cm/cm\\_documentation/policy\\_180066/](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/cm/cm_documentation/policy_180066/)
- FAST Toolset: <http://fast.faa.gov>
- NAS-MD-001: <http://172.27.70.66/md001/mdmenu2.asp>
- CCB Charters: <http://www.faa.gov/cm/charters.htm>
- FAA System Engineering Manual: <http://www.faa.gov/asd/SystemEngineering/index.htm>
- WebCM Portal: <http://webcm.faa.gov>
- WebCM Step-By-Step Instructions: <http://webcm.faa.gov/webCMPortal/index.jsp?zaction=stepByStep>
- CM Point of Contact List: <http://caeq.faa.gov/Cm/index.cfm?current=10>