Configuration Management in the FAA

A Brief for ARA/ATS

24 November 1998

Why Are We Here ...

We have a serious problem with CM

- **Lack of a central CM authority, policy, and information management**
- **Our current CM system has not been supported**
- **Inaccurate and inadequate baselines**

We need ATS & ARA commitment to CM

- **Integration of Acquisition, Ops & Maintenance**
- **Need to designate an organization to manage and enforce CM in the agency**
- **Clear roles and responsibilities**
- **Consistent policy and standards**

What do we need to make CM work?

A Single, Agency CM Approach

➡ **Integral to Operations, Maintenance and Acquisition**

Single

Organization Responsible for CM, Reporting to ATS <u>and</u> ARA

Consistent

and Balanced Application of Process and Policy

Skilled

Workforce and Technology to Effectively Perform CM

Commitment

from Associates and all levels of the organization

How can CM work?

A Single Agency CM Approach

➡ **Integral to Operations, Maintenance and Acquisition**

Organization

- Agency View of CM
- Independent CM Authority Reporting to ARA and ATS
- Responsive & Consistent Policy/Process
  - 50% Reduction in processing time for NCPs in the next year

Resources

- Trained, Skilled Workforce
- Dedicated Funding
- CM Performance Measures
- CM part of Org/Ind Performance Plans

Access/Accurate CM Information

- CM Information Architecture
- Effectiveness Audits and Reviews

Configuration Management

When properly applied, CM is used to help us:

- **Manage change and assess impacts of proposed changes**
- **Provide a mechanism to <u>know</u>:**

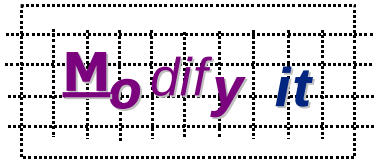
What we are <u>supposed</u> to build

What we <u>are</u> building

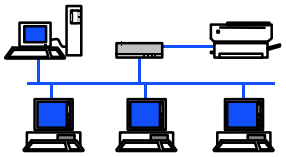
What we <u>have</u> built

- **So that we can:**

Support it



Build more like it



or Interface to it

An essential tool for managing large, complex systems

Historical Perspective

1980's - Centralized NAS Systems Engineering

- NAS Modernization Plan
- FAA Order 1800.8 - CM Policy- Roles & Responsibilities
- NAS 1000 Series - Technical Requirements
- FAA Order 1800.57 - established NAS CCB & CI's

1990's - Acquisition Reform

- IPDS - established IPTs
- AMS - designed to "replace" all acquisition orders (e.g., 1800.8)
- NAS Architecture
- CM BPR - consistent with AMS & IPDS

1997-98 - Refining and improving the CM Process

- CM Implementation Plan
- FAA Order 1800.8F converted to AMS Styled Policy Statements
- CM Steering Group

Process Obstacles

Characteristics:

- Lack of NAS Life Cycle Planning
- Lack of Representation by all Lines of Business
- Conflicting Policies and Processes
- Unclear Roles and Responsibilities
- Inconsistent Prioritization of CM
- Lack of Accountability

Real Life Impacts:

- HID/NAS LAN Installation (Operational Requirements not Included in Plans or Audits) - Additional Cost to Re-supply Spares Inventory, Additional Cost Associated with Reworking the Panels
- Korean Air Boeing 747 Crash - Safety, Additional Cost Associated with Investigating Change History
- AAS Requirements Creep - Schedule Slips, NAS Efficiency Jeopardized

Now:
- ✓ Endorse Independent CM Authority
- ✓ Sign CMSG Charter
- ✓ Semi-Annual Joint ATS/ARA Reviews of CM

Soon:
- ✓ Endorse Single Policy/Process and Implementation Plan
- ✓ Include CM in Performance Standards
- ✓ Promote Effectiveness Audits and Reviews

Resource Obstacles

Characteristics:

- Not enough skilled CM Practitioners
- Required CM Activities Not Being Performed Across the Agency
- CM Activities Not Being Performed at a Minimal Acceptable Quality Level
- Backlog of CCDs
- No funds for central CM Information Management

Real Life Impacts:

- CM Requirements Not Consistently Included in Development Contracts - Additional Cost to Convert Vendor Information into Operational Format
- CM not included in Planning and Budget - FCA/PCA Dates Jeopardized, Baseline Data Integrity Shortfalls
- Control of CM Managed Drawings Nonexistent/Inconsistent - Only 0.5% of the Drawings Under Regional CM Control
- Unimplemented CCDs result in inaccurate baselines

Now:
- ✓ Assess CM Resource Issues Within Your Organization
- ✓ Utilize CMSG as a Means to Address CM Concerns

Soon:
- ✓ Secure CM Budgets
- ✓ Include CM in Performance Ratings
- ✓ Comprehensive Training Program
- ✓ Application of iCMM
- ✓ Initiate CM Audits

CM Information Obstacles

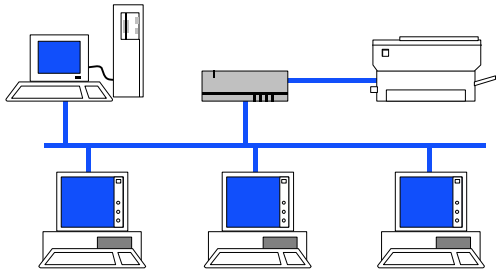
Characteristics:

- Duplicate/Incomplete Data Sources (Manual/Automated)
- Inability to Track/Link CM Information Across Life Cycle Phases
- Managing to Wrong Baselines/ Inaccurate Change Assessments

Real Life Impacts:

- Complete Change Assessments Not Performed or Inadequate - Safety, Schedule, and Costs Impacts
- FAA Assets Described Differently - Mod Installation Usually Paid For with Overtime Dollars, Additional Cost To Procure Spares
- Site Configurations Not Known - Go Back Teams (1 Program Alone Spent $8 Million)

Now:
- ✓ Joint ANS/ASD Prototype
- ✓ Promote Integrated Information Systems (Utilizing CMSG as a Point of Coordination)



Soon:
- ✓ Endorse CM Information Architecture
- ✓ Endorse Information Standards
- ✓ Promote Effectiveness Audits and Reviews

Making It Happen - The Vision

Dedicated CM Practitioners, Executing an Integrated Agency-wide CM Discipline That:

- Supports Planning, Life Cycle Management and Decision Making in the FAA Systems
- Satisfies Stakeholder Needs with Accurate, Current Information Throughout the NAS Life Cycle
- Demonstrates Subsystem Traceability to the NAS Architecture
- Reduces the Cost of Developing, Deploying, Operating, and Maintaining ATC Systems and FAA Facilities
- Reduces Risk of Failures
- Is Consistent with Evolving FAA Business Practices

Making It Happen - Plan

	Integrated Discipline	Dedicated Practitioners	Accurate, Current Information
Goals	*By 12/99, the FAA is working to a single, life cycle CM policy with accompanying process and procedures*	*By 12/99, budget for CM (at all levels NAS Architecture through Field Operations) and CM is included in Performance Measures*	*By 12/99, the standards based CM information architecture is established and there is an integrated/automated change management environment*
Measures	Number of CM Policy Documents ↓ Number of CM Processes ↓ Change Processing Time ↓ Number of Standard CM Products ↑ Operational Requirements Included In Procurements ↑	Level of Understanding of CM and its Relationship to Other Disciplines ↑ Quality of CM Products ↑ Number of "Required" CM Activities Not Being Performed ↓	Accurate System Change Assessments ↑ Availability of CM Information ↑ Complaints of Information Inaccuracies ↓
Focus Areas	Cross-functional Management Team (CMSG) Life Cycle CM Policy COTS Impacts Process & Procedures	CM Practitioners' Roles and Responsibilities CM's Relationship to Other Disciplines CM Resources Education and Communication	Stakeholders and Practitioners CM Information Needs and Requirements CM Business Rules and Standardization Technology Opportunities

Making It Happen - Timeline

Dedicated CM Practitioners, Executing an Integrated Agency-wide CM Discipline That

- Supports Planning, Life Cycle Management and Decision Making in the FAA Systems
- Satisfies Stakeholder Needs with Accurate Current Information Throughout the NAS Life Cycle
- Is Traceable to the NAS Architecture
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- Is Consistent with Evolving FAA Business Rules

01/98 -12/98

Document Life Cycle CM Activities and Roles

- Approved CMSG Charter
- Approved CM Policy
- CM Top Level Process
- CM Cost Estimates
- CM Information Needs Analysis

01/99 -12/99

Provide Guidance and Standardization

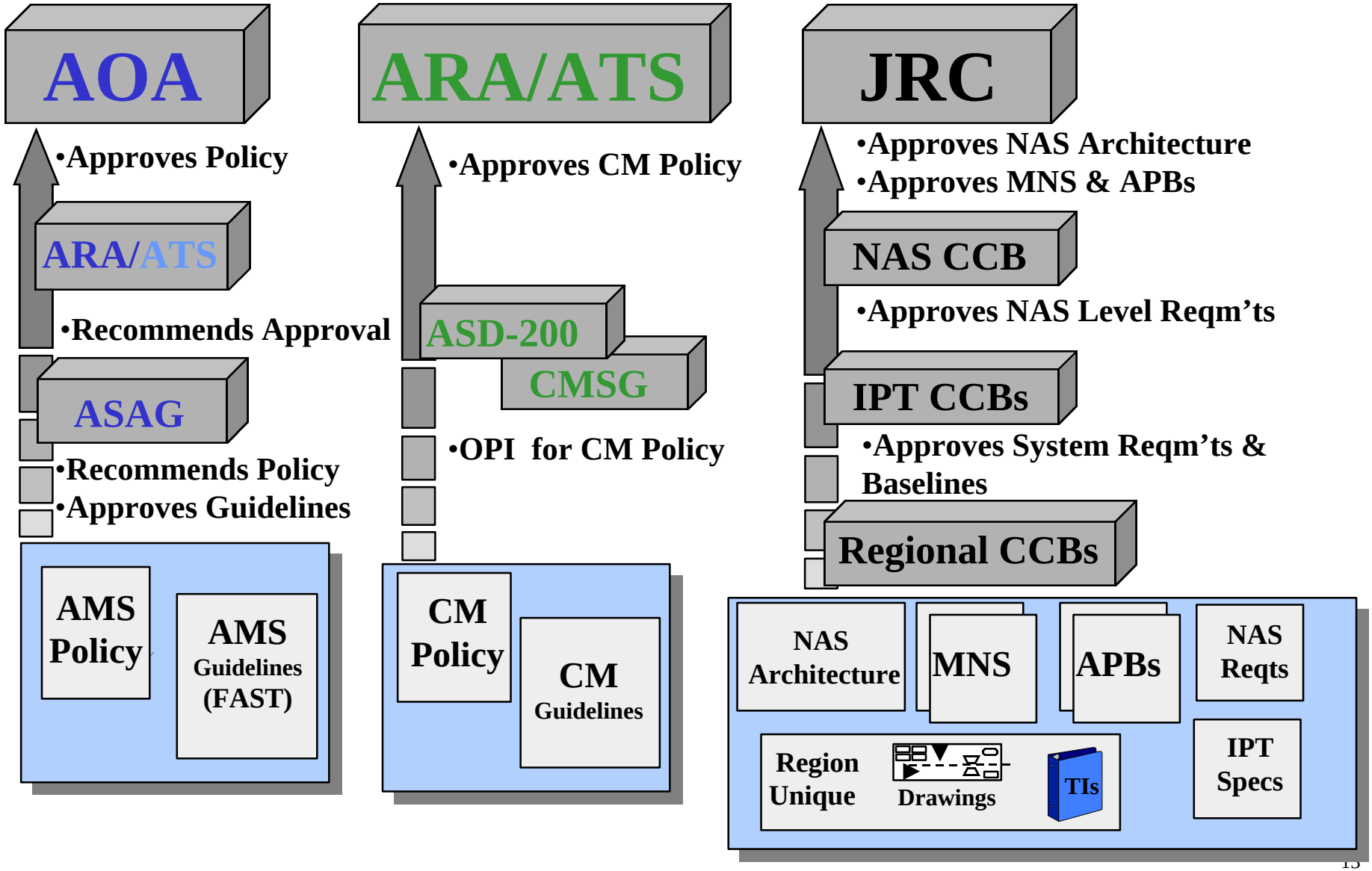
- CM Handbook/ Operating Procedures
- Information Architecture
- Documented Measures on Performance
- Investigate Impacts of CM Policy on Lines of Business (Beyond ARA and ATS)

06/99 -12/99

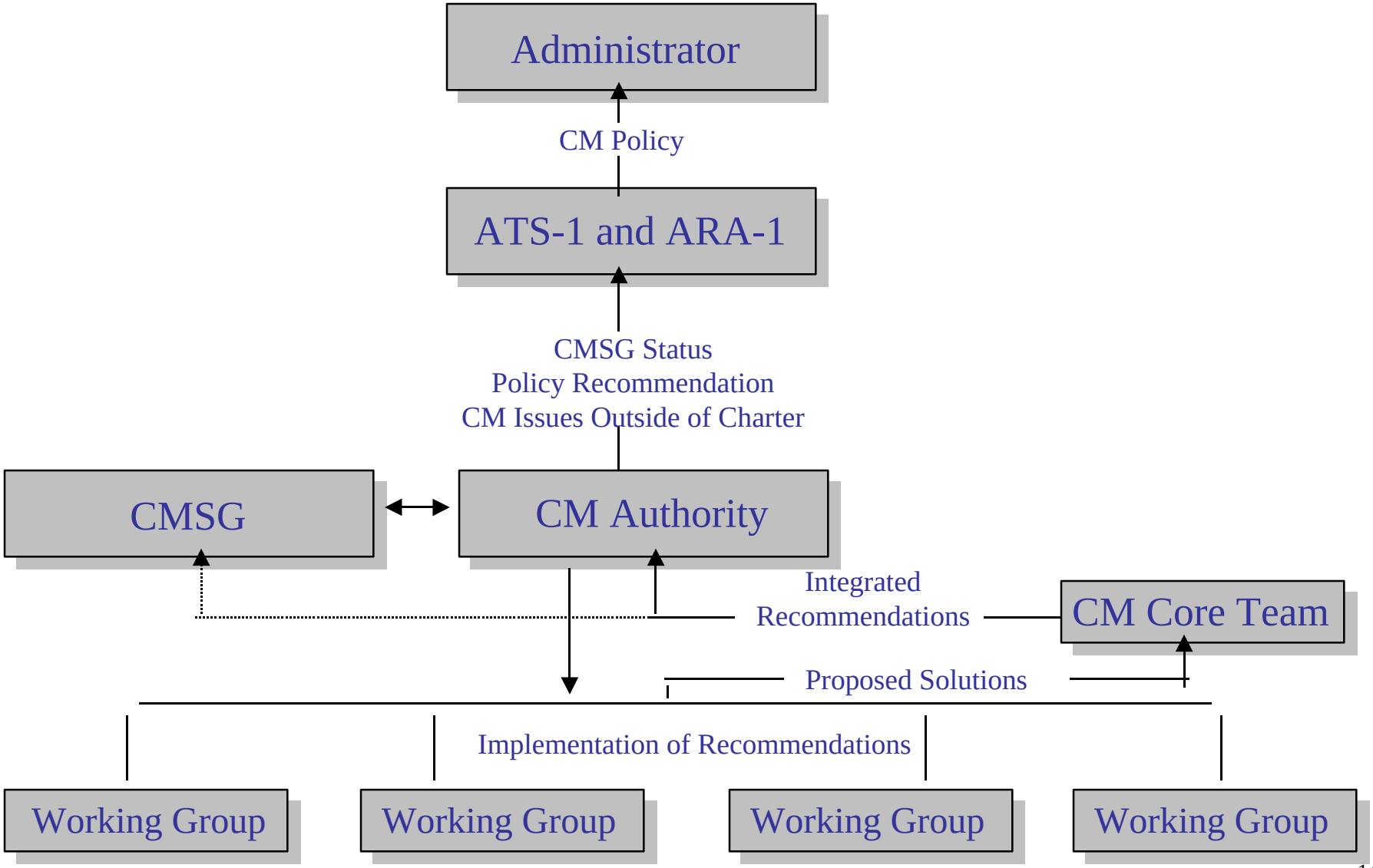
CM Optimization

- Implemented Technology Enhancements
- CM Effectiveness Measures
- Support of Level 3 iCMM
- Activity Based Costing
- Traceable to the Architecture

Making It Happen - Structure



Making It Happen - Operationally



CMSG Membership

Initial

R. Wein	ASD-200
R. Long	ANS-2
A. Douglas	ARX-1
A. Wong	ARN-1
T. Carrico	AIT-2
J. Loewenstein	AND-400
J. Hmara	AND-100
T. Hudson	AOS-2
N. Graham	AUA-600
D. Ford	AUA-300
M. Harrison	ASD-102
J. Heinen	ANI-7

Common Agreement

Broader Role Needed

Current

R. Wein	ASD-200
T. Gassert	AOP-1
J. Griffith	ATO-1
M. Hoover	ARU-1
J. Justiniano	ARX-1
R. Long	ANS-2
J. Nager	ANI-1
G. Terrell	AOS-1
A. Wong	ARN-1
N. Bowles	AML-1
C. Keegan	AOZ-1
R. Varette	AIR-500
J. Williams	ACE-470
D. Buckanin	ACT-300
A. Feinberg	AND-300
D. Ford	AUA-300
N. Graham	AUA-600
M. Harrison	ASD-100
J. Hmara	AND-100
J. Link	AND-400
J. Loewenstein	AND-700
J. McKenna	AUA-200
R. Polillo	AAR-600
A. Pyster	AIT-5
D. Stadtler	AUA-400
J. Wiley	ACT-200

CMSG Goals

The CMSG is an agency-wide forum of senior managers dedicated to the establishment and promotion of an integrated FAA CM discipline that:

- ***Supports planning, life cycle management and decision making for FAA systems;***
- ***Satisfies stakeholders needs with accurate, current information throughout the NAS life cycle;***
- ***Is traceable to the NAS Architecture;***
- ***Reduces the cost of developing, deploying, operating and maintaining ATC systems and FAA facilities; and***
- ***Is consistent with evolving FAA business practices***

Progress Made

Organization

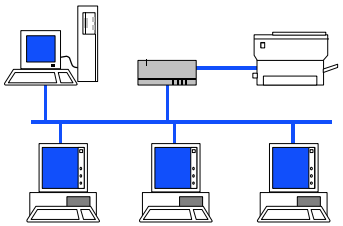
- Agreement on Independent CM Authority
- CMSG
- Interim Guidance
- Draft Agency CM Policy
- Draft Agency CM Process
- CCBs-FARM Teams

Resources

- Team Identifying Resource Needs
- Training (Awareness, Basic)

CM Information

- Needs Survey
- Prototype
- Resource Catalog
- Web Sites



Our Direction

- ***Implement Single Agency Policy& Process***
- ***Develop and promulgate Guidance & Standards***
- ***Develop and approve CM Implementation Plan, coordinate resulting activities***
- ***Implement Integrated CM Information Management System***
- ***Evaluate Agency CM Performance***
- ***Implement Comprehensive Training Program***
- ***Ensure Consistency of CM within iCMM***
- ***Ensure Traceability to Ops Requirements and Architecture***

Results

- ***Move Agency toward Level 3 (and above) CM***
- ***Reduce Cost of Acquisition***
- ***Reduced cost of Operations***
- ***Higher Availability***
- ***Minimize Risk to Safety***

What We Want From You

- **Promote CM as an Agency Discipline**
- **Designate ASD-200 as the Agency Authority Responsible for CM**
  - **Reporting to ARA <u>and</u> ATS**
- **Approve CMSG Charter**
- **Approve Our Direction**

Promote CM

How do We Support CM as an Agency Discipline?

- Joint Letter to all ATS & ARA personnel stating CM is integral to our work
- Agreement on how to handle CM Policy
- Support for developing performance standards
- Agreement for CM Audits
- Brief and train all ARA & ATS elements
- Initiate Discussions with other LOBs

Next Steps

- Complete Policy coordination and obtain approval
- Integration of policy, process, information management, resource and organization elements
- Complete identification and justification of resource requirements
- Complete implementation plan for CM
- Continue communication and coordination
- Joint review for ARA & ATS March 99