



National Airspace System Configuration Management (CM) Orchestrating Resilience Across the FAA

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We are currently on the lagging edge of the third industrial revolution, sometimes called the digital revolution. It involved the development of computers and IT (information technology) since the middle of the 20th century.



The Fourth Industrial Revolution (4IR) characterized by **a fusion of technologies** that is blurring the lines between the physical, digital and biological spheres, collectively referred to as cyber-physical systems.

- n.wikipedia.org/wiki/Fourth\_Industrial\_Revolution



In the FAA's 4IR Future **Integrity** and **Traceability** will not be optional, it will be absolutely necessary

#### Unmanned Aircraft Systems (PB13 and beyond)



FAA Goals: What you have



FAA Current State : What you have



#### FAA Goals: What you want to do



In the FAA's 4IR Future Resilience will not be optional, it will be absolutely necessary

**Resilience** is impossible without **Connectivity and Discipline** Can you find what you need in 3 minutes or less? Can its truthfulness be verified? Can you trust it? Truth, Trust, Traceability = CV







FAA Future State : What it will take to realize and manage getting there



FAA Future State : What it will take to realize and manage getting there





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SÆ	SYSTEMS MANAGEMENT	EIA-649™		REV. C
INTERNATIONAL	STANDARD	lssued Revised Superseding B	1998-05 2019-02 EIA-649B	
	(R) Configuration Manageme	ent Standard		

#### RATIONALE

This standard was revised to clarify principles, content and to remove opinions in order to improve the quality and adoptability by all enterprises, whether commercial or government, regardless of industry.

#### FOREWORD

This standard is intended to be used when establishing, performing, evaluating or improving Configuration Management (CM) processes.

When appropriately and effectively applied, CM provides a positive impact on every aspect of the product life cycle. CM is a comprehensive process for establishing and maintaining consistency of any product's performance, functional and physical attributes with its requirements, design, and operational information.

The essence of CM, as portrayed in this standard, is the common-sense application of CM functions and their underlying fundamental principles, which have universal applicability across the broad spectrum of commercial and governmental enterprises. Collectively, the functions and principles in this document are meant to be used like a compass; they provide the reliable direction required to stay on course and aid in sound decision making moving forward.

This standard provides the rational basis upon which to apply good judgment in both planning for and executing CM. An understanding of not just what to do, but why it is necessary to tailor the application of CM functions.

This standard treats CM principles as statements of fact which relate to implementing actions. The implementing actions for each CM function are defined in CM planning guided by the type of product involved and the environments in which it is to be developed, produced, marketed, distributed, used, and maintained. Because of the broad scope of its applicability, this standard is not written as a requirements document, per se, but as the foundation document upon which requirements may be structured.

Since terminology varies considerably in different application environments, this standard provides neutral terminology for each defined term so that a user can determine appropriate substitutes for specific context, clarity, and understanding. Regardless of the term used, the same principles apply.



649C

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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 .

When appropriately and effectively applied, CM provides a positive impact on every aspect of the product life cycle.



Collectively, the functions and principles in FAA adopted EIA-649C Configuration Management Standard will be used as the FAA's compass; they will provide the reliable direction required to stay on course and aid in sound decision making moving forward.

What it takes to realize, sustain and command

## When appropriately and effectively applied, CM provides a positive impact on every aspect of the product life cycle.

Principle CM-1. Configuration Management implementation requires a balanced and continuous application of CM functions and their underlying principles throughout the product life cycle.



What it takes to realize, sustain and command

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.

The term "product" in the 649 standard is interpreted as applicable to all

product categories; e.g.,

- documents,
- facilities, firmware,
- hardware,
- software,
- tools,
- materials,
- processes,
- services,
- systems.



What it takes to realize, sustain and command



Configuration Management must transcend and enable the Enterprise

#### What's needed: CM Orchestration



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#### What's needed: CM Orchestration

#### **FAA Configuration Control Board Structure**

NAS CCB

AJW-261

AJW-1

ANG-B AJW-261 202-267-6099

202-267-3568 202-267-2766

202-267-9536

Cornell Collie

C Jim Linney

Inform	ation & Data Gov	ernance	L Carol Ja
C TBD			 
C TBD			

		Automation CCE	3	
С	Tony Delavega	AJW-14	405-954-3647	
С	James Benjamin	AJM-2130	202-267-0459	
Е	John Antonucci	AJM-224	202-267-0674	
L	Lisa Rosser-Fox	AJM-2A/CTR	202-236-4584	
L.	Gary Fitzpatrick	AJM-2A/CTR	202-203-6834	

	Communication CCB					
с	Jim Mullin	AJW-174	609-485-6934			
C/E	Scott McCluskey	AJM-3122	202-267-7765			
L	Marlo Allen	AJM-3122/CTR	202-247-0763			
L	Shobhana Kannan	AJM-3122/CTR	202-386-9637 ext. 209			

	Navigation CCB					
С	Sylvester lvory	AJW-143	405-954-9773			
С	Kimberly Ten Pas Bell	AJM-324	202-267-9704			
E/L	TBD	AJM-324				
L	Cynthia Little	AJM-324/CTR	703-373-0831			

Γ	Surveillance CCB				
С	Tony Delavega	AJW-14	405-954-3647		
С	Michael Weiler	AJM-231	202-267-0685		
E	Milton Ryan	AJM-231	202-267-0677		
L	Lisa Rosser-Fox	AJM-2S/CTR	202-236-4584		
L	Rob Jaeger	AJM-2S/CTR	202-479-4009 ext. 137		
L	Brenda Shaid	AJM-2S/CTR	202-257-5615		

Aviation Weather & Aeronautical Services CCB					
с	Gina Kugel	AJW-17	609-485-5874		
C (Alt)	Tony Delavega	AJW-14	405-954-3647		
с	Donald Ward	AJM-3300	202-267-0486		
E	Linh Ngo (Wx & Aero)	AJM-3300	202-267-0789		
L	Denise Glover (Wx)	AJM-3300W/CTR	202-203-6907		
L	Gwen Monroe (Aero)	AJM-3300A/CTR	202-314-1302		
L	Kachelia Sellman (Aero)	AJM-3300A/CTR	202-847-4656		

Flight Services CCB				
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С	:	Steven Villanueva	AJR-B	202-267-6491

Power Systems, Facilities and Infrastructure CCB				
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1	С	Jeremey Traylor	AJW-223	405-954-9715
	С	Gerard Oswald	AJW-2431	
	Е	Leonard Mensah	AJW-2442	202-267-6093
	L	Niaz Abdulmatheen	AJW-2431/CTR	202-646-2213
	L	Rebecca Tarr	AJW-2431/CTR	202-646-2004

Updated 04/24/2019

	Legend
С	Co-Chair
Е	Executive Secretariat
L	CCB Lead
Alt	Alternate

Eastern Service Area (ESA) CCB					
	С	Alex Garcia	AJW-E2	404-305-6216	
	С	Michael Wagner	AJV-E1	404-305-6981	
1	L	Cecil West	AJV-E11	404-305-6988	
	L	Yolanda Walker	AJV-E11	404-305-6987	
	L	Veronica Lewis	AJV-E11	404-305-6982	

		Central Se	rvice Area (CSA) C	СВ
4	C/L	Michelle Hicks	AJV-C11	817-222-4048
	с	Noel Cavazos	AJW-C24	817-222-4400
	L	Mary Guyton	AJV-C11/CTR	817-222-4957

Western Service Area (WSA) CCB						
С	Calvin Ngo	AJW-W24A	425-227-2345			
с	Marco Angel	AJW-2W12	425-227-1026			
с	Sushil Deodhar	AJW-2W13	425-227-2323			
с	Jayanti Sangani	AJW-2W12	425-227-1819			
С	Steve Houser	AJW-2W17	907-271-5218			
ECL	Cindy Furukawa	AJV-W11	206-231-2316			
L	Anna Hersey	AJV-W11	206-409-4986			
EL (ALT)	Turan Wright	AJV-W11	206-231-2326			
L (ALT)	Calvin Best	AJV-W11/CTR	206-231-2315			





To meet FAA 4IR development and sustainment integrity and resilience demands, it will require more than these enterprise enabling "best practice" methodologies.





# To meet FAA 4IR development and sustainment integrity and resilience demands, a foundation of 649C+ Configuration Management will be <u>required</u>.

Product Lifecycle Management (PLM&ERP)



## **Configuration Management**

CM: the application of solid, practical procedures that result in cost avoidance and enhanced product quality and stability.

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# Truth Trust Traceabilitym

**Benefits towards goals:** 

- Establishment and sustainment of an authoritative source of information
- Collaboration across capability roles, functions, and systems
- Improving efficiencies
- Improving information flow
- Improving process effectiveness
  Eliminating waste
- Improving product control

## What's Needed: Development/Acquisition Support



DoD defines digital engineering as: an integrated digital approach that uses authoritative sources of system data and models as a continuum across disciplines to support lifecycle activities from concept through disposal.





## What's needed: Operational Support



DoD defines digital engineering as an integrated digital approach that uses authoritative sources of system data and models as a continuum across disciplines to support lifecycle activities from concept through disposal

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# Truth Trust Traceability

**Benefits towards goals:** 

• Establishment and sustainment of an authoritative source of information

- Collaboration across capability roles, functions, and systems
- Improving efficiencies
- Improving information flow
- Improving process effectiveness
  Eliminating waste
- Improving product control
   A leaner, more reliable and resilient enterprise series

# **Crossrail: A CM Success story**

First time in the history of the world that a Mege Project (\$14B) was

Delivered on time (actually 1 day ahead of schedule)

At Budget (not a single penny over) With the quality and value desired (as verified by the client)

## **Crossrail: A CM Success story**

#### **Crossrail Asset Information Strategy**

Configuration Management	Asset Management Requirements & Standards	Asset Representation	Asset Breakdown Structure	Asset Classification & Definition	Asset Naming & Labelling
<ul> <li>Rigorous control of all established configuration items and have all processes and procedures in place to record the asset configuration</li> </ul>	<ul> <li>Asset Information Requirements</li> <li>Asset Identification Standards</li> <li>Asset Information Contract Clauses</li> </ul>	<ul> <li>Type 1 Asset         <ul> <li>Fixed</li> <li>Structure</li> </ul> </li> <li>Type 2 Asset         <ul> <li>Replaceable</li> <li>hardware</li> <li>asset</li> </ul> </li> <li>Type 3 Asset         <ul> <li>Replaceable</li> <li>equipment</li> <li>and software</li> </ul> </li> </ul>	<ul> <li>Complex (e.g. Crossrail)</li> <li>Facility (Rail station, track, rolling stock, etc.)</li> <li>Primary functional unit (e.g. Escalator)</li> <li>Functional unit (e.g. Step)</li> <li>Asset tag</li> <li>Equipment</li> <li>Serial number</li> </ul>	<ul> <li>Asset Data Dictionary (Hierarchy of classes)</li> <li>Asset Data Dictionary Definition Documents (AD4s)</li> </ul>	<ul> <li>Naming of different asset classes based on location, function and class</li> </ul>





The FAA must be a place where Truth is strengthened and Falsehood is recognized and marginalized

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## **ECM Contact Information**

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# Thank You.

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