

National Aeronautics and Space Administration

NASA Earned Value Management (EVM) Update

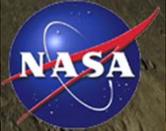
EVM World

**Jerald Kerby
May 2013**

evm.nasa.gov

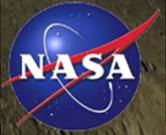


Outline

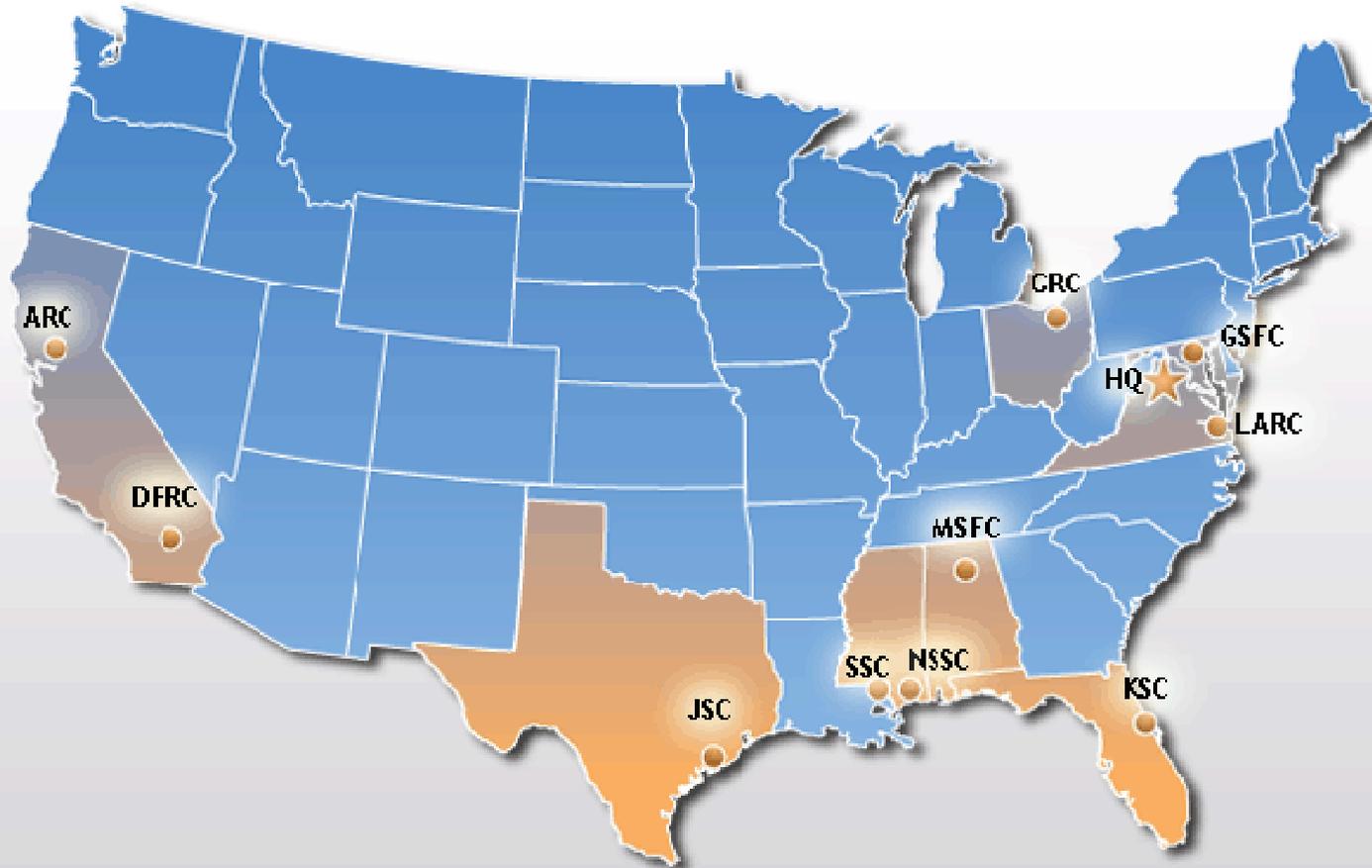


- NASA Centers
- EVM Requirements
- EVM Assessment/Maturity Model
- EVM Goals/Partners
- EVM Capability
- Surveillance
- Lessons Learned
- Available EVM Resources
- Organization Focal Points
- GAO Audit
- Summary
- Questions

NASA Centers



NASA Earned Value Management (EVM) Update



10 Centers
1 FFRC

(Click on Center location to view Center pages)



Overarching EVM Requirements

- **OMB Circular A-11** requires for total project EVM (in-house and contracted effort) to comply with the ANSI/EIA-748 guidelines
 - Details are in the **Capital Planning Guide Supplement**
- The OMB Circular A-11 requirement has been flowed down to the current version of **NPR 7120.5**



NASA Document Hierarchy

Update

Defines
"What"

EVMS

Defines
"How"

Authority / Requirements

- GPRA of 1993
- PMA 2002
- OMB Circular A-11
 - NPDs
 - NPR 7120
 - MPDs / MDs
- MPRs / Programs
- MWIs / Projects

Handbooks / References

- ANSI/EIA 748
- PMI PMBOK
- NDIA PMSC EVMS Intent Guide
- EVM Capability Documentation
- NASA Schedule Management HB
 - IBR HB/Toolkit
 - WBS Handbook
 - EVM Handbook

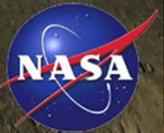
Forms the foundation for EVM and facilitates training, mentoring, tool development, assessment, and integration

NASA Earn



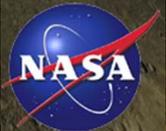
NPR 7120 EVM Requirements

- **Planning** begins during **Formulation**.
- EVM is applied in **phases C and D** to **projects** with an estimated life cycle cost **>\$20 million** and to **Phase E modifications, enhancements, or upgrades** with an estimated cost **> \$20 million**.
- EVM system complies with the **guidelines** in ANSI/EIA-748 and is described in the **Project Plan**.
- **EVM** system requirements are **flowed down** to applicable **suppliers**. (NFS 1834 is applied to contractors.)
- The project's **Performance Measurement Baseline (PMB)** is **established in Phase B** in preparation for **KDP C approval** and is **assessed** during **a review of the integrated baseline for the project**.
- **Project** EVM reporting begins no later than **60 days** after the start of Phase C. **Contract** EVM reporting begins no later than **90 days** after contract award.



EVM Requirements - Excerpts of Interest

- 7120.5D: (Past)
 - (2) The Project's EVM approach is in-place by KDP C and implemented in Phase C through KDP E.
 - (4) As a minimum, **EVM principles, as defined by ANSI/EIA-748, Earned Value Management Systems**, apply from KDP C through KDP E, if the project's life-cycle cost is at or greater than \$20M.
- 7120.5E (Present)
 - 2.2.7 Programs, at the discretion of the MDAA, projects in phases C and D with a life cycle cost estimated to be greater than \$20 million and Phase E project modifications, enhancements, or upgrades with an estimated development cost greater than \$20 million shall perform earned value management (EVM) with an **EVM system that complies with the guidelines in ANSI/EIA-748, Standard for Earned Value Management Systems. Use of the NASA's EVM capability and processes, will ensure compliance with the ANSI standard. This capability allows tailoring to match the individual needs of the program or project, while still meeting the ANSI-748 guidelines.**
 - 2.2.8 EVM system requirements shall be applied to applicable suppliers in accordance with the NASA Federal Acquisition Regulation (FAR) Supplement 1834.201 and to in-house elements.
 - 2.2.9 In accordance with the NASA Federal Acquisition Regulation (FAR) Supplement 1834.201, **EVM system requirements shall be applied to applicable suppliers and to in-house work elements.** For contracts that require EVM, a Contract Performance Report (CPR), Integrated Master Schedule (IMS), and Work Breakdown Structure (WBS) are required deliverables and the appropriate data requirements descriptions (DRDs) included in the contract and/or agreement.
 - 2.2.10 For projects requiring EVM, **Mission Directorates shall conduct an pre-approval integrated baseline review as part of their preparations for KDP C** to ensure that the project's work is properly linked with its cost, schedule, and risk and that the systems are in place to conduct EVM.



EVM Requirements

NASA Projects		
> \$50M	\$20M to \$50M	\$0 to \$20M
32 Guidelines NASA System	32 Guidelines NASA System	Non-EVM Performance Mgmt
Flow-Down to Contractors		
> \$50M	\$20M or More	Less than \$20M
32 Guidelines Validated Full EVM Terms and Conditions of DRDs	32 Guidelines Compliance Full EVM Terms and Conditions of DRDs	Non-EVM Performance Mgmt Performance Mgmt Terms and Conditions of DRD
All Supporting Contractors		



EVM Assessment/Maturity Model

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NPR 7120.5e

NPR 7120.5d

Levels provide foundations for continuous improvement of EVMS

Monitoring the efforts to improve the Earned Value Management system

**Level 5
Optimizing**

Managing the quality of the EVM data

**Level 4
Managed**

ANSI 748 compliant, organization-wide

**Level 3
ANSI 748 Compliant**

Less than fully compliant with ANSI 748, limited project use

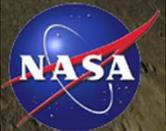
**Level 2
Localized**

No or limited EVM implementation in place

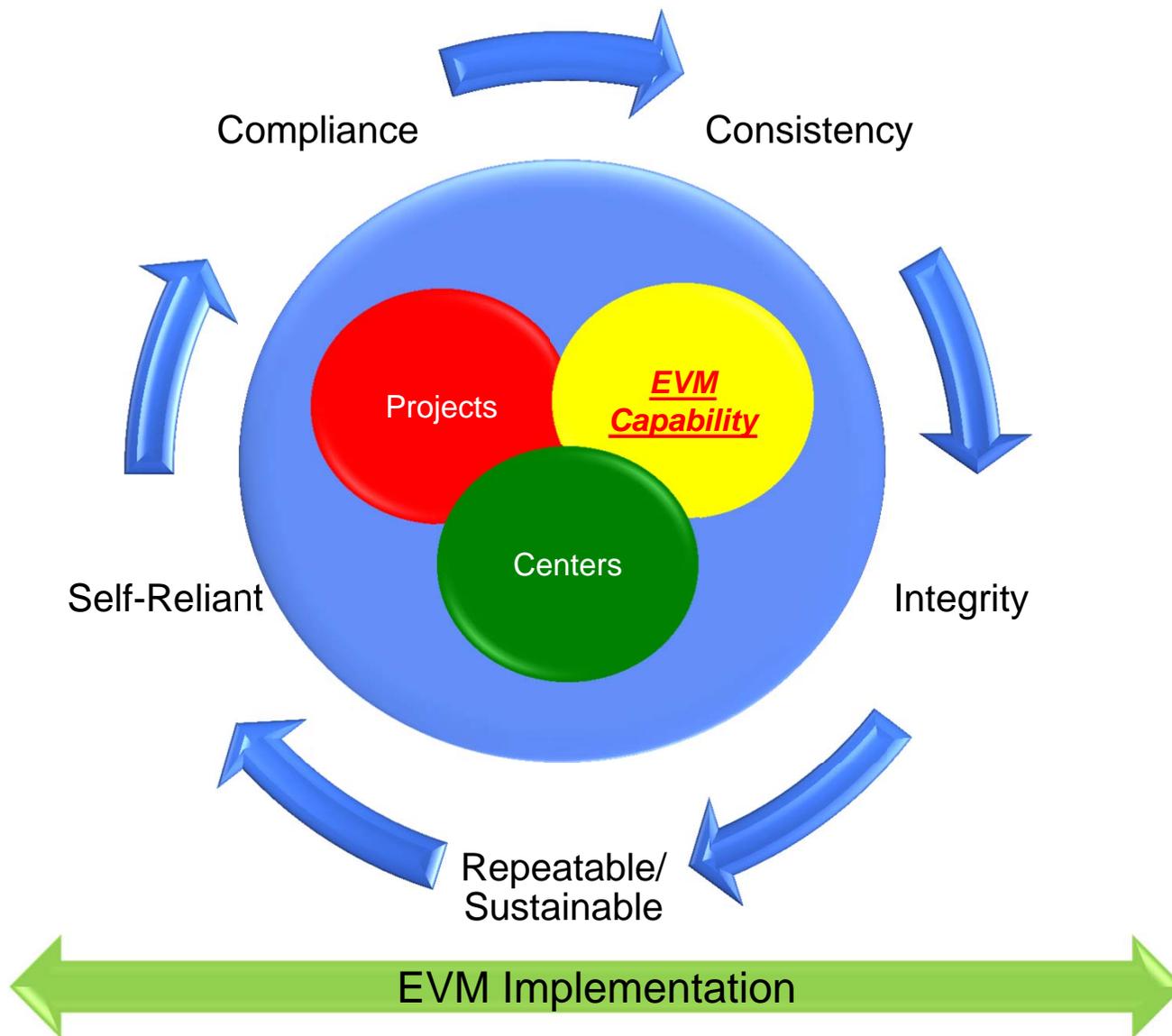
**Level 1
Initial**

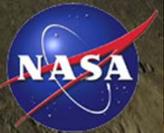
The Earned Value Management Maturity Model[®] and the abbreviation EVM³[®] are trademarks of MMI

- Requirements and Process in place
- Future Implementation will key



NASA EVM Goals/Partners





What is the NASA EVM Capability?

Overall Objective was to develop an Agency EVM capability that complies with the guidelines in ANSI/EIA-748 and test through two pilots, refine and finalize EVM process and documentation based on test results.

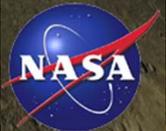
- A **common agency EVM capability/process** that complies with the guidelines in ANSI/EIA-748 for in-house projects
- **Documented** with supporting handbooks, instructions, workarounds, etc.
- **Tested** through two pilot projects, Extra-vehicular Activities (EVA) and Ice, Clouds and Land Elevation Satellite (ICESat) II
- **Approved** by independent Peer Review Team with representation from each Mission Directorate and Center
- Reported to a senior level Agency Steering Committee represented by each Mission Directorate and Center
- Approved **initial (phased) rollout** by the Agency Project Management Council (APMC)
 - **Space Launch System (SLS)** - (MSFC)
 - **ICESat II** (GSFC)
 - Focus on EVM flow-down to **contracts across the Agency**



Products Developed by EVM Capability

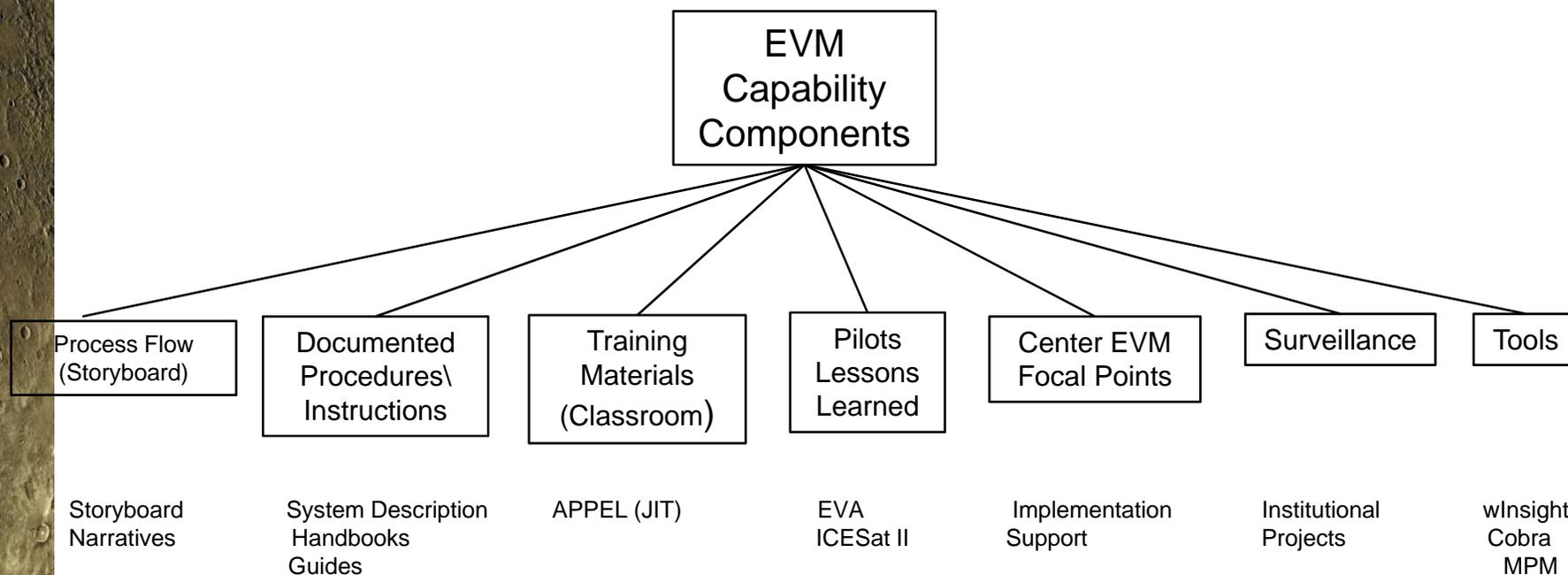
- ✓ EVM process flow diagrams (Storyboard)
- ✓ System Description (Detailed Process)
- ✓ Narratives (Summary Process)
- ✓ Project-Control Account Manager's (P-CAM) Reference Guide
 - Provides a quick reference for Technical Managers
- ✓ EVM Handbook
 - Overall Agency and general EVM guidance
- ✓ Pilots results
 - Lessons Learned/Issues/Workarounds/Recommendations
- ✓ EVM Acceptance/Surveillance Strategy
 - Acceptance Strategy
 - Surveillance Overview
- ✓ Software Acquisition Strategy
 - Hardware/Software access/acquisition
- ✓ Training Modules by Process Area
 - Modularized training for each process area

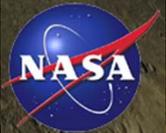
Latest documents are on the www.nen.nasa.gov website under the EVM sub community folder



EVM Capability Toolbox

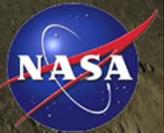
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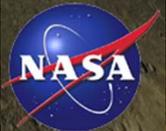
Maintaining Integrity through Surveillance

- Surveillance is a key function to ensure usefulness as a management tool and compliance with external mandates.
- Surveillance Frequency (programmatic/institutional)
 - Recurring assessment as part of the lifecycle reviews and
 - NPR 7120.5 Center Surveys
- Mature EVM Capability for improved support of multi-center programs and projects



Top 5 Lessons Learned (linked to remaining risks)

1. Projects have to consider EVM Implementation from **Day 1** of project
 1. Each time a **charge code is created it effectively changes the technical WBS** for the life of the project
 2. Where will the work be controlled and performance taken? EVM construct must be considered for **control accounts and work packages.**
2. **Support Contractor costs** will continue to be a constraint unless proper cost **reporting requirements** are flowed down to contracts
 - Support Contracts are often **owned by other organizations** outside of the projects with no EVM requirements.
3. **Work Authorization agreements** that document an agreement of scope, schedule and budget by both sponsor and performing orgs. are fundamental to the implementation of EVM
4. **PP&C skills must be strengthened** to support EVM and project management
5. **Senior Level Management support** is needed across the agency with the change management process



NASA EVM Resources

POLICY, HANDBOOKS, GUIDANCE

- NPR 7120.5
- EVM Handbook
- Scheduling Handbook
- IBR Toolkit
- WBS Handbook
- Project Control Account Manager (CAM) Guide (draft)
- Standardized WBS (7120.5)
- EVM Capability Products
 - Process/Storyboard
 - System Description
 - DRDs

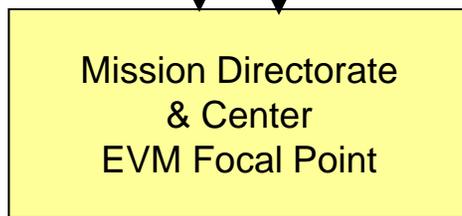
PRODUCTS & SERVICES

- Center EVM Implementation Plans and Support
- Support for Agency and Centers EVM Policy & Procedures
- Training
- RFP Development
- SEB EVM Evaluation
- IBR Support
- Data Analysis/Tools
- Surveillance
- In-house EVM Support

MISSION

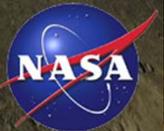
PROGRAM / PROJECT

REQUEST



RESOURCES, SYSTEMS, TOOLS

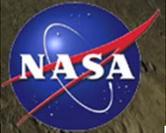
- Automated Tools
 - wInsight/Cobra
- Access to Training Materials and
 - online EVM/Scheduling/CAM/IBR training available through SATERN
- Websites
 - evm.nasa.gov
 - Internal material/Knowledge Now
 - nen.nasa.gov
- EVM Working Group Meetings and Peer Support



Organizational EVM Focal Points

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ORGANIZATION	NAME	EMAIL ADDRESS	TEL
Headquarters - Focal Points			
IPCE	Charles Hunt	charles.d.hunt@nasa.gov	202.358.0803
Procurement	Carl Weber	carl.c.weber@nasa.gov	202.358.1784
OCIO	John Bosco	john.f.bosco@nasa.gov	202.358.1352
OCFO	Louis Barbier	louis.m.barbier@nasa.gov	202.358.1421
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HEOMD	Cris Guidi	cristina.guidi-1@nasa.gov	202.358.1777
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Glenn	Bob Sefcik	robertj.sefcik@nasa.gov	216.433.8445
Goddard	Stephen Shinn	stephen.a.shinn@nasa.gov	301.286.5894
	Julie Baker	julie.m.baker@nasa.gov	301.286.8096
Jet Propulsion Lab	Cal Chambers	calvin.r.chambers@jpl.nasa.gov	818.354.0092
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Kennedy - Deputy Chair	Kristen Kehrer	kristen.c.kehrer@nasa.gov	321.867.3691
Langley	Dr. Barry Lazos	barry.s.lazos@nasa.gov	757.864.5731
Marshall - Chair	Jerald Kerby	gerald.g.kerby@nasa.gov	256.544.3243
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	Robert Ross	robert.b.ross@nasa.gov	228.688.2320



NASA EVM Website (Homepage)

evm.nasa.gov

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Earned Value Management (EVM)

- OVERVIEW

+ TUTORIAL

+ REGULATIONS/REQUIREMENTS

+ EVM FOCAL POINTS

+ IMPLEMENTATION HANDBOOKS

+ EVM TRAINING INFORMATION

+ EVM REPORTS

+ LINKS TO OTHER EVM SITES

+ EVM GLOSSARY

+ EVM ACRONYMS



+ NASA Home > EVM

The mission of the NASA Earned Value Management (EVM) website is to provide a primary on-line reference point for EVM theory, application, and use as an integrated project management process within NASA.

OVERVIEW

What is EVM?

EVM is an integrated management control system for assessing, understanding and quantifying what a contractor or field activity is achieving with program dollars

- Integrates technical, cost, schedule, with risk management
- Allows objective assessment and quantification of current project performance
- Helps predict future performance based on trends.

EVM provides project management with objective, accurate and timely data for effective decision making

Policy References

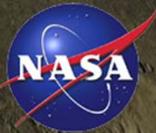
OMB Circular A-11, Part 3; NPR 7120.5 Program/Project Management Processes and Requirements; Industry Guidelines, ANSI/EIA-748 Standard for EVM Systems



- + Freedom of Information Act
- + Budgets, Strategic Plans and Accountability Reports
- + The President's Management Agenda
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- + Information-Dissemination Priorities and Inventories
- + NASA Safety Reporting System



Curator: MITS
NASA Official: Jerald Kerby
Last Updated: January 22, 2010
+ Contact NASA
+ SiteMap



NASA Engineering Network <https://nen.nasa.gov>

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NASA ENGINEERING NETWORK

HOME OCE LESSONS LEARNED **COMMUNITIES** TOOLS & RESOURCES SEARCH

Rover Prototype Set To Explore Greenland Ice Sheet

Submitted by [NASA Engineering Network](#) from JPL on May 02, 2013

NASA's newest scientific rover is set for testing May 3 through June 8 in the highest part of Greenland.

[View All](#) [Submit New](#)

WELCOME

Welcome to the **NASA Engineering Network**, where engineers may access Lessons Learned; interact with their discipline's Technical Fellow, subject-matter experts, and practitioners through Communities of Practice; search many NASA repositories of interest, and find tools and resources.

Mike Ryschkewitsch
NASA Chief Engineer

00:00 00:00

SPOTLIGHT

OCE Events: April 2013

- 2-3 - Aerospace Safety Advisory Panel
- 3 - SELDP Selection Interview/Decision Mtg
- 16 - Program Management Council
- 16 - IEEE/Keynote Systems Conference 2013
- 18 - ISS ATV 4 "Albert Einstein", Ariane 5
- 24 - ISS Progress 51
- 24 - Baseline Performance Review
- 26 - Strategy Implementation Planning (Satellite Communication Review)
- 30 - Strategic Management Council Face-to-Face

Young Professionals Blogs

The Young Professional's Blog is an area for early career engineers to showcase their work, the tools that they use, and what it is like to work as young professional at NASA. Follow, collaborate, and develop a cross-agency understanding of a new generation of engineers that are eager to share their career development.

COMMUNITY OF PRACTICE

Flight Mechanics

Flight Mechanics encompasses atmosphere definition and measurement (earth and planetary trajectory design and analysis; modeling for simulation; flight mechanics simulation and analysis (including Monte Carlo methods); flight measurement techniques; flight testing...

[Dan Murri](#)

[All Communities](#)

[Previous](#) [Next](#)

FEATURES

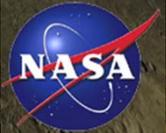
[Organization Charts](#)

[Collaboration Tools](#)

DESIGN PRINCIPLES

To promote excellence in design and avoid known risk top level design principles and design requirements from across the Agency are listed here.

NASA-NPR-7120.5E / 7120.7 / 7120.8
NASA Space Flight / Information Technology / Research & Technology Program and Project Management Requirements



NEN - NASA Community of Practice

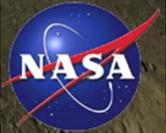
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TECHNICAL DISCIPLINE			MANAGEMENT DISCIPLINE	
Aerosciences	Flight Mechanics	Nondestructive Evaluation	Customer Advisory Committee	Product Data and Life-Cycle Management (PDL M)
Autonomous Rendezvous and Docking	Guidance, Navigation and Control	Passive Thermal Control and Protection	Earned Value Management	Program/Project Management
Avionics	Human Factors	Propulsion	Knowledge Management	
Electrical Power	Life Support/Active Thermal	Software Engineering		
Entry, Descent and Landing	Loads and Dynamics	Space Asset Protection		
Environmental Test & Verification	Materials	Structures		
Fault Management	Mechanical Systems	Systems Engineering		



NEN - NASA EVM Community of Practice

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EARNED VALUE MANAGEMENT

Program/Project Management » Earned Value Management

EXPLORE THE SUBCOMMUNITY

- Sub-Community Home
- Contact List
- Document Repository
- NASA Public Links
- Suggestions
- Back to Program/Project Management

OVERVIEW

Earned Value Management (EVM) is an integrated management control system for assessing, understanding and quantifying what a project is achieving with its resources. EVM integrates technical, cost, and schedule with risk management; it allows objective assessment and quantification of current project performance, and helps predict future performance-based trends.

WELCOME

Welcome to the Earned Value Management (EVM) sub-community of the Program/Project Management Community of Practice.



Lead: **Jerald Kerby**
Facilitators: **Keri Murphy**

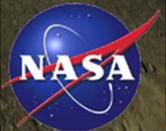
COMMUNITY LINKS

 Contact List Search and locate Headquarters, Mission Directorate, and Center EVM Focal Points	 NASA Public Links View information from NASA's EVM public portal
 Document Repository Find EVM process, reference, and training documents	 Suggestions Submit an idea or suggestion to the community

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NEN v4.0
Editor: **Daria Topousis**
NASA Official: Hal Bell
+ Contact NEN

Focus Areas in response to GAO EVM Recommendations

- Corrective action plans to focus on the following areas
 - Rollout of EVM Capability (NASA EVM Process)
 - Conduct Skills Assessment
 - Develop Change Management Plan
 - Strengthen EVM Surveillance
- NASA will periodically report to GAO on the progress that the Agency has made to the recommendations corrective action plan



Key Components of EVM Process

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Architecture

- ✓ Processes
- ✓ Documentation
 - ✓ Tools
- ✓ Customer Support

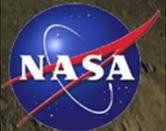
Implementation

- ✓ Requirement (7120)
- ✓ Roll Out Support
- ✓ Surveillance Program

Education & Training

- ✓ Curriculum
- ✓ Training Materials
 - ✓ Target Audiences

Everything is in place for implementation



Questions?