National Aeronautics and Space Administration

NASA Enhance EVM Implementation CAP Initiative

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Agenda

- GAO High Risk List
- Timeline
- Corrective Action Plan
- Approach
- Areas of Focus
- Summary
- Questions

What is the GAO High Risk List?

Every two years at the start of a new Congress, GAO calls attention to agencies and program areas that are high risk due to their vulnerabilities to fraud, waste, abuse, and mismanagement, or are most in need of transformation.

The key elements needed to make progress in High Risk are top-level attention by the administration and Agency leaders grounded in the five criteria for removal from the High Risk List, as well as any needed congressional action. The five criteria include:

- **Leadership commitment**: Demonstrated strong commitment and top leadership support.
- **Capacity**: Agency has the people and resources to resolve the risk(s).
- **Action Plan**: A corrective action plan exists that defines the root cause, solutions, and provides for substantially completing corrective measures including steps necessary to implement solutions which GAO recommends.
- **Monitoring**: A program has been instituted to monitor and independently validate the effectiveness and sustainability of corrective measures.
- **Demonstrated Progress**: Ability to demonstrate progress in implementing corrective measures and resolving the high risk area.

GAO designated NASA's acquisition management as high risk in 1990 in view of NASA's history of persistent cost growth and schedule delays in the majority of its major projects. GAO recognizes that NASA has made progress in the five years between 2012 and 2017, but that NASA also faces significant challenges in some of its major projects largely driven by the need to improve the completeness and reliability of its cost and schedule estimating, estimating risks associated with the development of its major systems, and managing to aggressive schedules.

Timeline

- **September 2018** - Agency senior leadership determined that a new Corrective Action Plan was necessary to continue driving improvements in NASA's program and project management policies and processes.
  - Recent challenges in cost and schedule growth experienced by several of the Agency's highest profile missions;
  - Continued inclusion of NASA's acquisition practices in the GAO's biennial High Risk Report; and
  - NASA's steadfast commitment to good governance and stewardship of the resources entrusted to it
- **December 2018** - Agency Program Management Council (APMC) approved a set of initiatives to provide value for acquisition management improvements
  - Encompasses a collection of specific initiatives and areas of emphasis NASA is committed to pursuing as it continues to mature its program and project management policies and processes, as well as its related surveillance of contractors through appropriate insight and oversight.
- **Overall goal**: Strengthen the Agency's cutting-edge program and project management efforts across the board and improve transparency for NASA's stakeholders.

Corrective Action Plan Initiatives

2018 CAP Initiatives

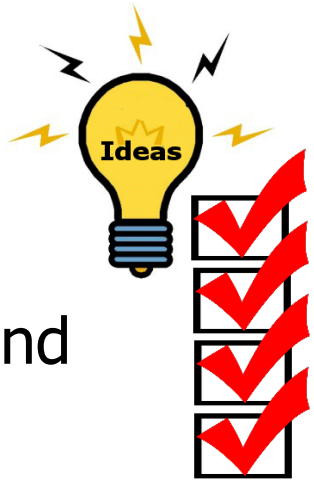
- **Initiatives to Implement**
  - **Enhance Earned Value Management Implementation**
  - Improve HEOMD Portfolio Insight and Status
  - Implement Programmatic (PP&C) Training Curriculum
  - Include Original Agency Baseline Commitments for Performance-Driven Re-baselined Projects
  - Enhance Annual Strategic Review Process
  - Create Technology Readiness Assessment (TRA) Best Practices Document
  - Update Probabilistic Programmatic Policy (including new JCL requirements)
- **Initiative to Pilot**
  - Create a Schedule Repository
- **Initiative to Research**
  - Enhance Implementation Indicators for Trends and Projections
- **Areas of Emphasis**
  - Improve NASA's Governance of Strategic Acquisitions
  - Risk Assessment, Requirements, and Concept Definitions Early in the Formulation Phase
  - Contractually Incentivizing High Performance

2019 CAP Initiatives

- Enhanced Procurement Database to Enable Enriched Analysis
- CADRe Enhancements:
- Schedule Repository (move from pilot to implementation
- Realistic Cost Estimate
- Risk Factors or Performance for Formulation Phases:
- Risk Assessment and Financial Evaluation of Contractors

Approach

- Developed a list of achievable ideas to enhance EVM implementation at NASA



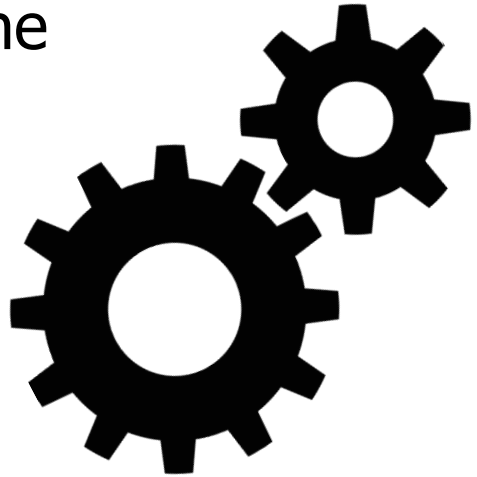
Known weak area

Actionable

Impactful

Timely

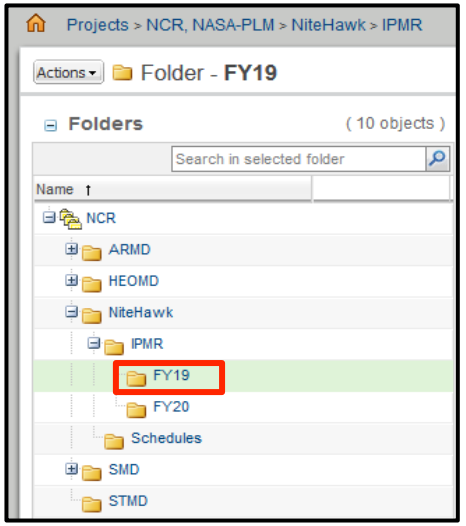
- Common themes: EVMS Surveillance and Reporting
- Issued senior leadership policy letter to refine requirements and expectations
- Updated training materials, handbooks, guides, reference materials with the new policy, etc.



Areas of Focus: EVM Reporting

- ✓ Require EVM metrics to include independent EACs at Baseline Performance Review (BPR) including SPI and CPI (current, CTD, 3-, 6-, 12-month) and EAC
  - ✓ More questions are being asked which leads to better data

- ✓ Require CPR and IPMR submittals to central repository
  - ✓ Central repository established on Windchill and currently being populated
  - Still working to get 100% participation, but much progress has been made
  - Utilize info for independent reviews, data mining, cost estimating, studies, etc.



	WBS	Description	SV	CV	VAC	BCWS	BCWP	ACWP	SV	SV%	CV	CV%	Bac	Eac	VAC
1	123456.08.05.09.01.01	Determine Proje	↔	↔	↔	38.0	38.0	39.7	0.0	0.00	-1.7	-4.39	38.0	39.7	-1.7
2	123456.08.05.09.01.02	Analysis/Softwa	↔	↔	↔	45.4	45.4	46.7	0.0	0.00	-1.2	-2.73	45.4	46.7	-1.2
3	123456.08.05.09.01.03	Review	↑	↑	↓	80.4	52.0	50.2	-28.4	-35.37	1.8	3.41	110.8	134.8	-24.0
4	123456.08.05.09.01.04	Identify Protot			↔	0.0	0.0	0.0	0.0	0.00	0.0	0.00	172.0	172.0	0.0
5	123456.08.05.09.01.05	Delevop Functio			↔	0.0	0.0	0.0	0.0	0.00	0.0	0.00	44.1	44.1	0.0
6	123456.08.05.09.01.06	Develop Functio			↔	0.0	0.0	0.0	0.0	0.00	0.0	0.00	30.1	30.1	0.0
7	123456.08.05.09.01.07	Develop Prototy			↔	0.0	0.0	0.0	0.0	0.00	0.0	0.00	36.5	36.5	0.0
8	123456.08.05.09.01.08	Testing	↔	↔	↔	9.3	9.3	9.9	0.0	0.00	-0.6	-6.01	20.4	21.0	-0.6
9	123456.08.05.09.01.09	Post Implementa			↔	0.0	0.0	0.0	0.0	0.00	0.0	0.00	18.8	18.8	0.0

Areas of Focus: EVMS Surveillance

- NASA has a long history with EVM surveillance
  - 2012 GAO audit on EVM recommended that NASA implement formal EVMS surveillance; classified as priority finding in 2017

- EVMS surveillance – three perspectives
  - Enhance ***in-house*** EVM surveillance
  - Enhance ***contracted*** EVM surveillance
  - Use NASA resources to conduct EVM surveillance on ***major suppliers were DCMA does not have an existing presence (APL, JPL, SwRI)***
  - Require data anomaly reports and corrective action plans

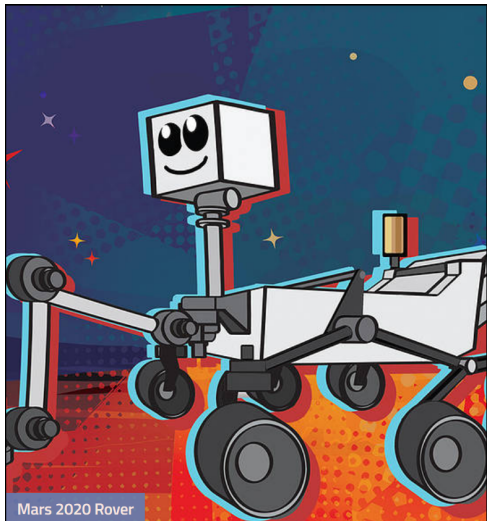
EVMS Surveillance Guiding Principles

- **Principle 1:** Ensure credibility of the EVM data to support informed decision making
- **Principle 2:** Minimize disruption to the projects
  - Surveillance schedules will be developed and coordinated in advance
  - CAM discussions only conducted by exception when there are recurring data anomalies
  - Joint surveillance is encouraged
  - Leverage Supplier and In-House internal surveillance processes especially their Plans and Reports. Use their Plans and Reports to guide Agency-level surveillance
  - Surveillance assessments are expected to be completed both virtually and onsite, with site visits schedule once per year
- **Principle 3:** EVMS surveillance is modeled from DCMA data driven EVMS surveillance processes. Not duplicate DCMA work. Perform surveillance where DCMA does not have a presence.
- **Principle 4:** Agency surveillance process will not replace internal EVMS surveillance process or in any way remove the responsibility to implement and maintain the EVMS on project.

Areas of Focus: EVMS Surveillance

- **In-house:**
  - NASA has an EVM system description, including processes and tools
    - CAP required roll out of EVM Capability to remaining Centers

  ✓ Develop a surveillance approach and annual EVM surveillance schedule
    - ✓ Projects are selected annually to undergo EVMS surveillance at the project level
    - Require projects to run data anomaly reports and create corrective action plans
    - Engage organizational Focal Points to conduct EVMS surveillance within their organizations
      - The results of the internal surveillance with inform the overall annual plan



Areas of Focus: EVMS Surveillance

- **Contracts:**
  - Improve EVM flow-down for contracts by following the guidance in the NASA EVM Contract Requirements Checklist
  - ✓ Ensure EVMS surveillance is delegated to DCMA
    - ✓ All applicable contracts are now delegated to DCMA
    - Increase engagement between projects and DCMA on surveillance issues

- **Contractors without a DCMA presence (Not for profits, universities, labs, etc.)**
  - ✓ Hired three NASA contracted SMEs to conduct EVM surveillance on major suppliers such as Jet Propulsion Laboratory (JPL), Johns Hopkins University Applied Physics Laboratory (JHU-APL) and Southwest Research Institute (SwRI)
  - ✓ Supplier EVMS surveillance plan and approach developed
  - ✓ Surveillance has started at two of the three organizations
    - Surveillance on the third organization will begin in Q2 of FY20

Summary

- ✓ CAP developed and approved by NASA senior management
  - ✓ Policy letter issued
- ✓ EVM Reporting now required at senior level baseline performance reviews
  - ✓ More questions, more attention at the lower levels, data becomes self correcting
- ✓ EVMS Surveillance
  - ✓ Delegation to DCMA has occurred on contracts
  - ✓ EVMS plan developed for all three perspectives
  - ✓ Much progress has being made
- The implementation of the CAP activities will be an ongoing effort

Questions?


NASA

Links and Documents

- NASA/DCMA MOU for Earned Value Management

  https://www.nasa.gov/evm/mou

- DCMA EVMS Compliance Metric Templates

  https://www.dcma.mil/HQ/EVMS/

- DCMA Program Support Analysis and Reporting (*DCMA-MAN-3101-02)

DCMA-MAN-3101-02.doc

- Reports on Outstanding Government Accountability Office and Inspector General Recommendations

  https://www.congress.gov/bill/115th-congress/senate-bill/2276/text

- NASA Response to Recent Programmatic Performance and NASA's Designation on GAO's High Risk List

NASA High Risk Corrective Action

Links

- NASA: Earned Value Management Implementation across Major Spaceflight Projects Is Uneven **https://www.gao.gov/products/GAO-13-22**
- High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas https://www.gao.gov/products/GAO-19-157sp
- GAO Priority Recommendations Letter to NASA Administrator https://www.gao.gov/assets/700/698632.pdf

Corrective Action Plan Overview (1 of 2)

- **Ownership & Responsibilities**
  - NASA AA assumes ownership
  - OCFO SID maintains CAP documentation, tracking, reporting, and subsequent updates
  - Lead Executives/Organizations in various initiatives responsible for execution and progress reports
  - Supporting Organizations responsible for supporting Lead Executives or Organizations
- **Initiatives**
  - To Implement
    - Will proceed and become part of regular Agency business cadence. Any actions will follow all established Agency control and oversight boards, as applicable, to ensure no unintended consequences are experienced.
  - To Pilot
    - Show promise to provide value related to Agency acquisition management, but will initially be executed to a limited degree in scope and time until the Agency assesses and reaffirms continued execution.
  - To Research
    - Less conceptually mature but warrant dedicated effort to explore and develop with respect to generation value for Agency acquisition management
- **Areas of Emphasis**
  - NASA will emphasize adherence to current policies and practices in certain areas and encourage improvements that will better position the Agency to manage cost and schedule performance.
  - No direct, measurable plans of action for the purposes of the Corrective Action Plan

Corrective Action Plan Overview (2 of 2)

- **Progress Tracking and Reporting**
  - Each initiative in the CAP includes planned next steps and metrics, where applicable. The lead organization(s) cited in the CAP will pursue actions as described. A subset of initiatives include specific forums for reporting progress or deliverables (e.g., APMC or BPR).
  - For all efforts in the CAP, OCFO SID will conduct an annual checkpoint to measure progress against the CAP. For odd-numbered years, the progress checkpoint will occur in the summer months. For even-numbered years, the progress checkpoint will be folded into the CAP update (see below).
  - OCFO SID will provide the overall progress and status update to the NASA AA. OCFO SID will also share and discuss progress with GAO annually at a minimum, and more often when applicable.

- **Corrective Action Plan Update Schedule**
  - NASA will keep this Corrective Action Plan current and up to date until the GAO removes the High Risk designation for the Agency.
  - The update process where initiatives and/or areas of emphasis are added, revised, or resolved will occur in the approximate period of May to September of even-numbered years. This timeframe will enable an informed GAO consideration of any changes made to the CAP, and support the GAO's timeline for preparation of the biennial publication of the High Risk Report (~January/February of odd-numbered years).
  - The NASA AA will retain the authority to make changes and revisions to the CAP at any time.

Background

- *GAO Audit in 2012 found that EVM Implementation across Major Spaceflight Projects is Uneven (GAO 13-22)*

- **Recommendation:** To improve the reliability of project EVM data, NPR 7120.5 should be modified to require projects to implement a formal surveillance program that:
  - Ensures anomalies in contractor-delivered monthly earned value management reports are identified and explained, and report periodically to the mission directorate's leadership on relevant trends in the number of unexplained anomalies.
  - Ensures consistent use of WBSs for both the EVM report and the schedule.
  - Ensures that lower level EVM data reconcile to project level EVM data using the same WBS structure.
  - Improves underlying schedules so that they are properly sequenced using predecessor and successor dependencies and are free of constraints to the extent practicable so that the EVM baseline is reliable.

Open GAO Recommendation

- Priority Open Recommendations for NASA – letter from GAO https://www.gao.gov/assets/700/698632.pdf

- Actions needed:
  - NASA partially agreed with this recommendation, stating that the reliability and utility of the EVM data needed to be improved but that it did not plan to implement a formal surveillance plan due to resource constraints. Since commenting on the report, in December 2018, NASA included an initiative in its Corrective Action Plan—a plan put in place in response to recent programmatic performance and NASA's designation on GAO's High -Risk List —to enhance EVM implementation. To fully implement this recommendation, NASA will need to take action and provide documentary support for several of its identified planned next steps to enhance EVM surveillance. Without implementing proper surveillance, NASA may be utilizing unreliable EVM data in its analyses to inform its cost and schedule decision making.

History

- Originally, NASA Partially Concurred due to Resource Constraints

- Actions committed to take in Nov. 2012
  1. Established surveillance process
     - Developed an EVMS Acceptance and Surveillance Processes
       - Included in the EVM Implementation Handbook
  2. Expanded Workforce Skills
     - Numbers haven't increased, but training on numerous occasions on EVM data anomalies has occurred
     - The data anomalies issue has been discussed in numerous forums, i.e., EVM Steering Committee, PPMB, EVM Working Group, etc.
  3. Provided analytical tools consistent with GAO's tools
     - Developed automated anomalies reports for both EVM and scheduling

- Recommendation closed by GAO – August 2015

NASA Corrective Action Plan (CAP)

- *GAO re-opened four areas in July 2017, among them Monitoring Program Costs and Execution, and identified nine priority recommendations.*
  - *EVM Surveillance recommendation identified as a priority*

- In January 2018, NASA reiterated its position that we will not implement a formal surveillance plan due to resource constraints.
  - However GAO continues to believe that implementing this recommendation would be beneficial and prevent anomalies in EVM data. Without implementing proper surveillance, NASA may be utilizing unreliable EVM data in its analyses to inform its cost and schedule decision making.

NASA Corrective Action Plan (CAP)

- *On January 4, 2019, the Good Accounting Obligation in Government Act or the GAO-IG Act was signed into law requiring each federal agency, in its annual budget justification, to include a report on each public recommendation of the GAO that is classified as open for longer than one year prior and the status of each such recommendation*


NASA