

# In the Driver's Seat: Program, Planning, and Control (PP&C)

Effective program, planning and control (PP&C) puts management in the driver's seat to successfully manage NASA's missions. Having the right type and level of programmatic information is essential to sound decision making. In an environment of constrained budgets, it is imperative to have accurate data and a skilled workforce without adding undue process and reporting requirements. Across the Agency, there has been a concerted effort to rebuild and improve NASA's PP&C capability. This PM Challenge session will share innovative PP&C techniques from both an institutional and a program perspective. A panel Q&A session will follow a brief overview of inventive practices that have been put in place at GSFC and within the Multi-Purpose Crew Vehicle Program.



Sandra Smalley

Lucy Kranz

Stephen Shinn

# Ask Questions, Find Help

**Virtual PM CHALLENGE** NASA Virtual Project Management Challenge

**Applications**

- Twin Otter
- X-43A (Hyper-X)
- Sub-scale Transport Aircraft
- ARES I-X Launch Vehicle
- X-29A
- Tu-144LL Supersonic Transport
- 1903 Wright Flyer Replica
- Global Hawk

There are many others ... 16



### Tour the Player (Virtual PM Challenge)

Info Chapters

Virtual PM Challenge

Send Technical Issues to:  
nasa-virtual-pm-challenge@mail.nasa.gov



### Audience interaction

- Links** - link to related reference materials
- Share presentation** - email a presentation link bookmarked to play from a specific point
- Polls**
- Ask a question** ✓

# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GODDARD SPACE FLIGHT CENTER

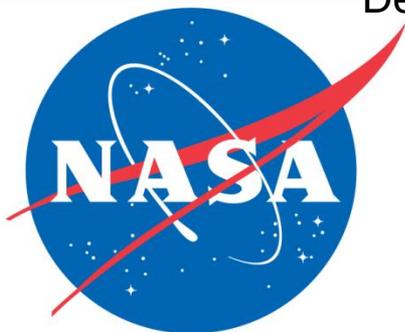
## FLIGHT PROJECTS DIRECTORATE

### In the Driver's Seat: Program Planning and Control

**Steve Shinn**

Deputy Director of the Flight Projects Directorate  
for Planning & Business Management

July 10, 2013

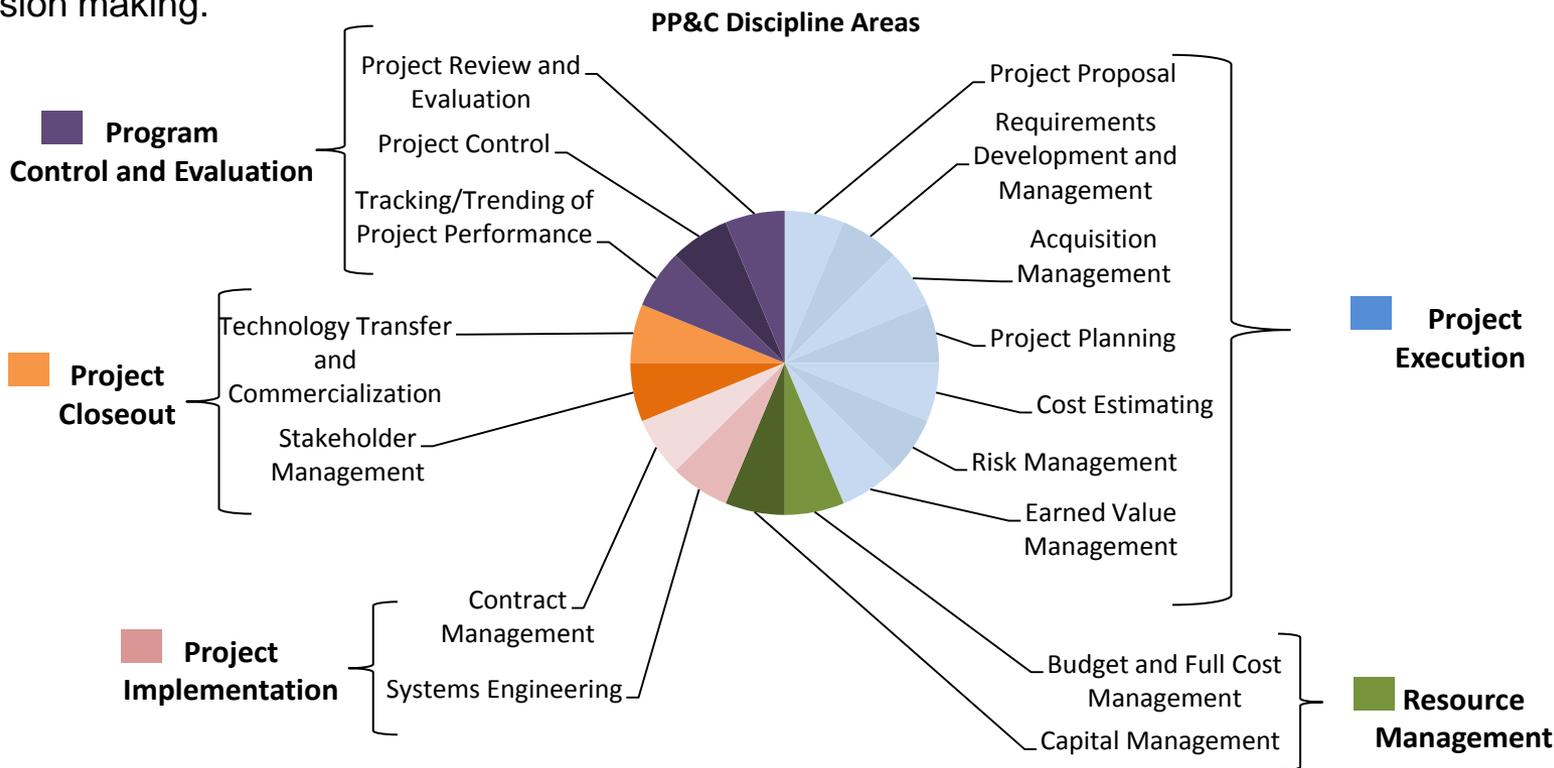


**IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL**

**BUSINESS CHANGE INITIATIVE IMPROVING GODDARD SPACE FLIGHT CENTER'S PP&C ENVIRONMENT**

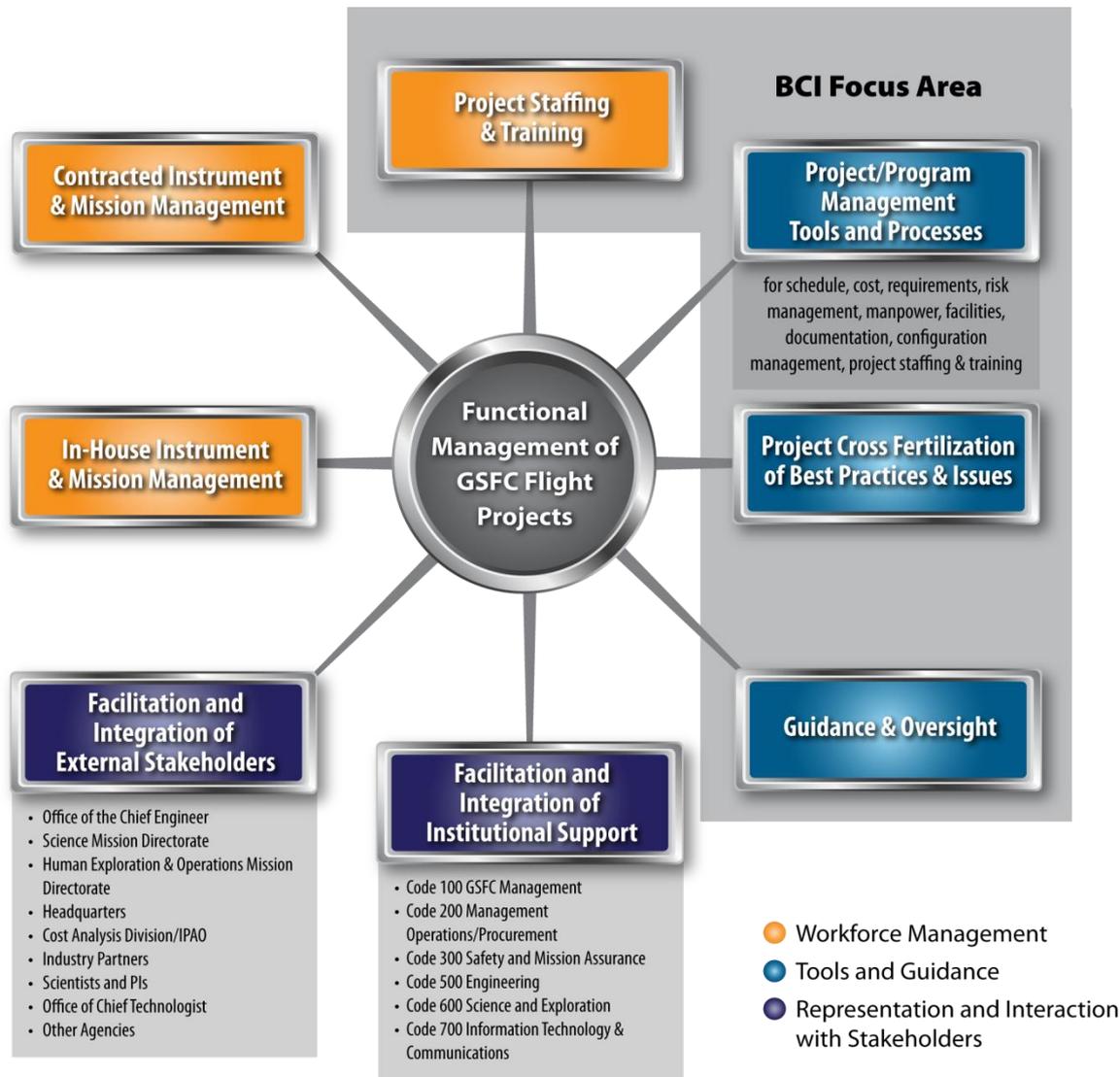
In late 2011, Goddard Space Flight Center's (GSFC) Flight Projects Directorate (FPD) created the Business Change Initiative (BCI) to examine the use of best practices, evaluate information sharing mechanisms, and identify suggested changes across the Directorate to improve cost, schedule, and technical performance.

Multiple teams are working to increase best practice sharing and deploying across programs/projects in PP&C methods, tools, processes, and knowledge to support improved performance and management decision making.



# IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

## GSFC FPD PP&C RESPONSIBILITIES



IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

GSFC PP&C ENVIRONMENT

Current State



A disparate community with pockets of PP&C expertise, which is not well known, and where programs/projects often create their own unique solutions to solve problems



Future State



An integrated community to educate, openly share, and instill best practices across the organization and within programs/projects

***Our vision is increased collaboration with programs/projects consistently applying best practices and actions to foster cost-effective and on-time delivery for all missions***

**IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL**  
**BCI – RESPONSE TO CHALLENGES**

***Environmental Challenges***

Rising costs, schedule delays, and disparate processes

Increasing budget constraints; perceptions of NASA and Center challenges

Possible retirement wave impacting knowledge capture and practices; need to ensure optimally-trained staff and sharing of best PP&C practices

Increasing external reviews and data requests

***Our Response – BCI***

Comprehensive evaluation of best practices and management, communication and information sharing mechanisms intended to improve cost, schedule and overall performance across programs and projects

***Outcomes***

- ✓ Improved knowledge base and sharing
- ✓ Increased use of best practices
- ✓ Reduced duplicative workflows
- ✓ Improved decision making
- ✓ More commonality in approaches and tools
- ✓ Optimized resources
- ✓ Improved project performance

## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

### BCI – FRAMEWORK

Action Teams support the development and assessment of different disciplines, program/projects, and activities in order to integrate efforts, institutionalize best practices, and enhance PP&C



- ◆ Initial five Action Teams focus on tangible actions to improve our effectiveness in sharing knowledge and best practices
- ◆ Progressing through five phases that guide changes from vision and definition through deployment
- ◆ Researching, surveying, and recommending best practices for streamlined project activities
- ◆ Creating guidance, templates, standards, tools, and training for FPD and the Center
- ◆ Implementing changes in core disciplines and adjusting as needed based on feedback and pilot implementations

◆ As the BCI progresses and additional opportunities for improvement are identified, additional focus teams may be formed. Currently, the BCI is initiating three new teams for Web Architecture, Configuration Management, and Project Management Tools

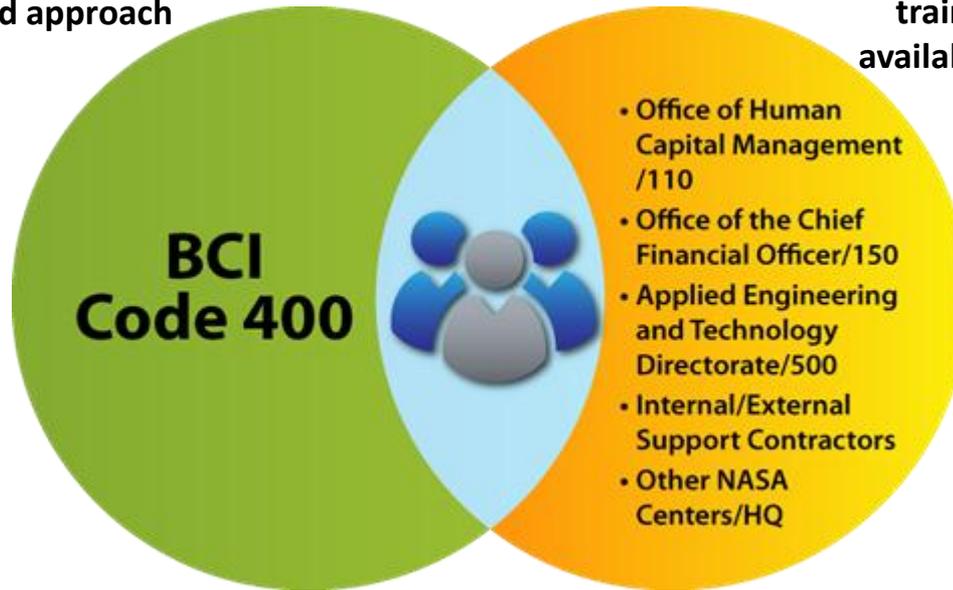
**IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL**

**COLLABORATIVE PARTNERSHIPS – ESSENTIAL TO SUCCESS**

Collaborated with GSFC Office of the Chief Financial Officer to create business training guidance and curriculum(s); coordinated on Center-wide Earned Value Management (EVM) needs and approach

Partnered with NASA Headquarters (HQ) Office of the Chief Engineer (OCE) on Agency-wide EVM guidance; solicited input to improve Center's management reporting process and to expand various training curriculums and extend availability to the programs/projects

Worked with the Applied Physics Laboratory (APL) and Jet Propulsion Laboratory (JPL) to collect lessons learned and identify Schedule BPIs, EVM requirements, and practical aspects of the Joint Confidence Level (JCL) Process across organizations



Collaborated with NASA HQ Cost Analysis Division (CAD) and other NASA Centers for JCL and cost estimating training

Collectively worked with GSFC Engineering and Human Capital Directorates to expand information repository for early-career professionals

*Note: These are examples of partnerships and not an exhaustive list*

**IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL**

**PP&C CHANGE INITIATIVES FRAMEWORK**

*All BCI implementations follow a similar approach to identify guidance gaps and leverage existing policies and practices*

**ESTABLISHED**

**BCI IN DEVELOPMENT**

**Agency Policy, Procedural Requirements**  
 NPR 7120.5, NASA Program and Project Management Processes and Requirements

- *NASA Agency EVM Handbook (providing feedback and support)*

**Center Policy, Procedural Requirements**  
 GPR 7120.7, Schedule Margins and Budget Reserves

- *GSFC/FPD Schedule Management Requirements Procedural Guidelines (PG)*
- *GSFC EVM PG*

**Principles and Best Practices**

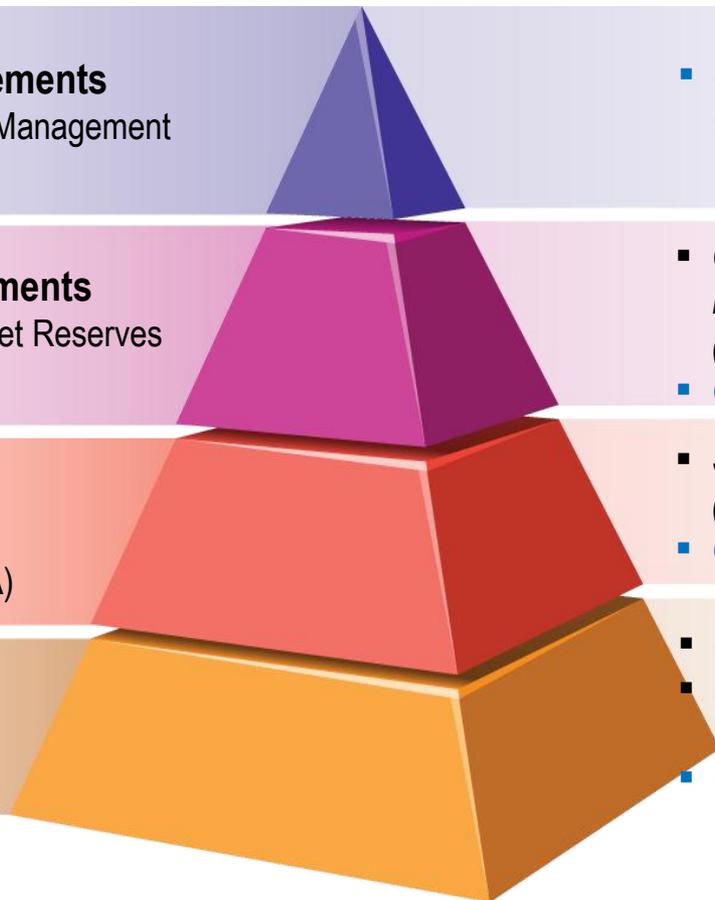
- Project Artifacts, Methods, Techniques
- Handbooks (GAO, DCMA, NDIA, NASA)

- *Schedule Best Practice Instructions (BPI)*
- *GSFC Joint Confidence Level Handbook*

**Tools and Resources**

- Commercial of the Shelf (COTS)
- Agency, Center Enterprise Licenses

- *GSFC EVM Enterprise License Upgrade*
- *Scheduling Knowledge Network (SharePoint Portal)*
- *Goddard Schedule Analysis Tool (GSAT)*



**IN THE DRIVER’S SEAT: PROGRAM PLANNING AND CONTROL**

**BCI – SCALABILITY FOR PROJECT ASSISTANCE & COMPLIANCE, INCREMENTAL APPROACH TO ENSURE LASTING CHANGE**



**Program/Project Lifecycle**

Survey and assess complete FPD program/project portfolio to understand similarities and differences



**Applicability**

Identify valid needs for each grouping of “like” programs/projects to balance conditions for feasibility and adoption



**Compliance**

Provide tools, templates, guidance, and resources to facilitate fulfillment of requirements for all applicable groups

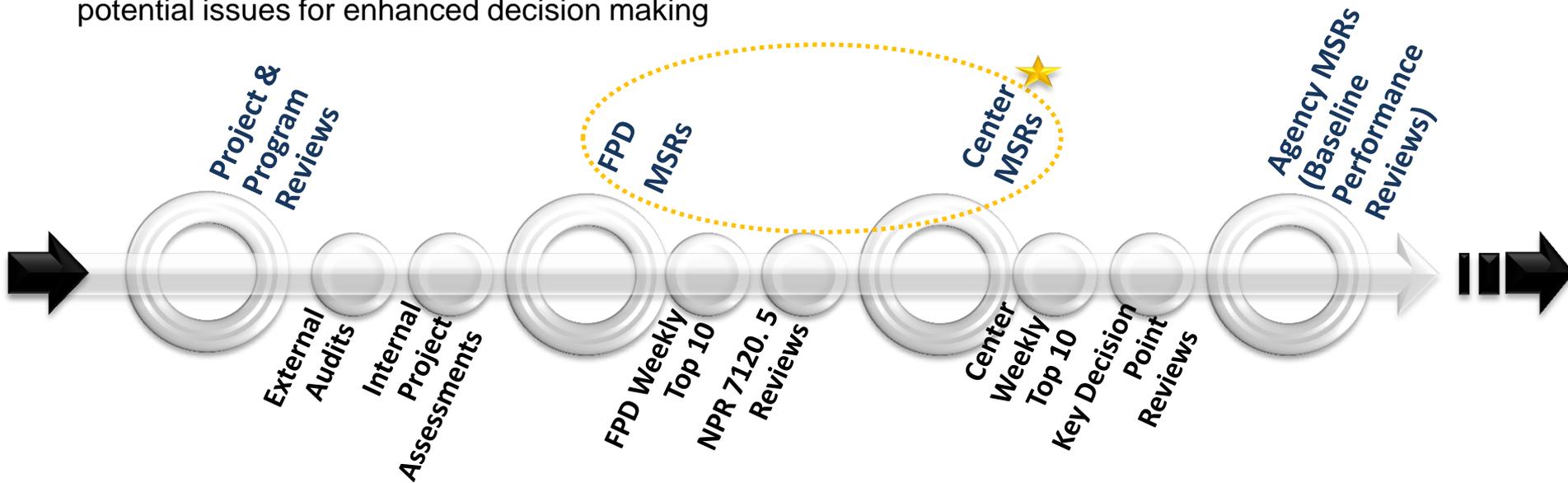
*Prior to deployment, each change is developed with consideration of the effect on and significance to the GSFC project portfolio.*

*In many cases, various projects will be piloted to measure ability to adopt new practices, and tools and resources are developed from the feedback received to assist in acceptance*

IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

BCI: MONTHLY STATUS REVIEW (MSR) REPORTING

**Objective:** Improve insight into projects performance, communication of status, and early warning of potential issues for enhanced decision making



**★ New MSR Guidance** – Modifications were made to streamline the reporting process from project reviews to the Directorate to the Center to the Agency. The result was improved clarity and traceability to program/project status

**[Executive]** Established consistency; standardized Summary Quad and Project Fever Summary charts

**[Cost and Schedule]** Furthered visibility; created Business Assessment Dashboard and Schedule Assessment (fever-style)

**[Issues, Risks, and Alerts]** Improved traceability; directed use of inputs from the Center Top 10 Issues and Risks database

**[Other & Backup]** Increased awareness; mandated inclusion of accomplishments and upcoming education/outreach

## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

# BCI: SCHEDULE MANAGEMENT GUIDANCE, TOOLS, AND RESOURCES



**\*New**



The PG establishes GSFC requirements for Schedule Management Plans, Integrated Master Schedules (IMS), Baseline Schedule Management, and Schedule Performance Analysis and Reporting

Thirty-one BPIs were developed based on GSFC successes, as well as practices identified from other Centers, industry and other agencies

The network is a SharePoint portal that houses the 31 BPIs and PG, as well as links to helpful aids, tools, templates, and resources

**Procedures and Guidelines (PG)**

APPROVED BY Signature: \_\_\_\_\_ Original Issued by: \_\_\_\_\_  
 EFFECTIVE DATE: June 11, 2013 NAME: George Hester  
 EXPIRATION DATE: June 12, 2018 TITLE: Director, Flight Projects

**COMPLIANCE IS MANDATORY**

Responsible Office: 400 / Flight Projects Directorate Office  
 Title: Schedule Management

**PREFACE**

**P.1 PURPOSE**

This directive defines the schedule management procedures and guidance for formulating and implementing flight and ground system projects in a manner that is consistent with Federal and Agency schedule requirements, and conforms to generally accepted planning and scheduling principles referenced in the NASA Schedule Management Handbook, the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK), and the National Defense Industrial Association's (NDIA) Planning & Scheduling Excellence Guide (PASEG). These Procedures and Guidelines (PG) are intended to support the planning and control needs of both internal and external project stakeholders, and serve as a framework for integrating and coordinating Goddard Space Flight Center (GSFC) Planning and Scheduling (P&S) best practices with NASA schedule requirements as described in NPR 7130.5, NASA Space Flight Program and Project Management Requirements, as well as applicable external stakeholder schedule best practices including those described in the Government Accountability Office's (GAO) Schedule Assessment Guide. This directive provides project teams the guidance required to make sound programmatic decisions by promoting the consistent use of P&S best practices to enhance cost and schedule performance and overall mission success.

**P.2 APPLICABILITY**

The PG applies to all Flight Projects Directorate (FPD) flight, ground systems, and instrument projects and activities, regardless of category or classification, to include all enumerable projects and principal investigator mode missions, including both Step 1 and Step 2 Announcement of Opportunity missions. (Refer to the "Baseline Guide for the Schedule Management of Flight and Ground System Projects and Activities" for more specific applications and guidance associated with Class II missions at <http://fdpi.gsfc.nasa.gov/inter/flight/Schedule-StdPages-56PG.aspx>) All project procedures shall comply with this document within six months of release.

CHECK THE GSFC DIRECTIVES MANAGEMENT SYSTEM AT <http://fdpi.gsfc.nasa.gov> TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

Document Schedule Requirements in Project Schedule Mgmt Plan	Develop In-House Subsystem Schedules Using PDL Checklist	Identify and Control Giver / Receiver Milestones	Design the Project Schedule Book	Assess Schedule Efficiency Along the Critical Path	Prepare an IMS Data Requirements Document
Assign a Lead Planner/Scheduler to the Project	Create an IMS Database in MS Project	Plan the Project Schedule Margin	Report the Critical Path for MSR	Report Project Control Milestone Performance and Forecast	Resource/Cost Load the Project IMS
Organize Project Schedule, Planning & Analysis Room	Estimate Realistic Activity Durations	Establish and Control the Schedule Baseline	Perform a Schedule Risk Analysis and Report Results	Report Total Slack Changes and Trends	Archive the Project IMS
Plan a Successful Schedule Summit	Document the Schedule Basis of Estimate	Implement a Schedule Control Board	Assess Baseline Schedule Performance with the BEI	Report Schedule Margin-to-Launch Trend	Assess Current Performance with the Monthly Hit/Miss Index
Develop the Project-Level Integrated Master Schedule (IMS)	Verify Schedule Integrity with Schedule Health Checks	Status and Update the Project IMS	Assess Current Schedule Performance with the CEI	Prepare and Update the MSR Critical Milestone Schedule	Reporting Summary Status with the Schedule Scorecard



Required



Recommended



As Needed

## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

### EXAMPLE SCHEDULE: BPI—CONDUCT A SCHEDULE PEER REVIEW

**\*New**

#### Schedule Peer Review Check List

1. Assign a Peer Review Chair
2. Select between two-to-four Peer Review members for the review board
3. Prepare a Peer Review Plan and deliver it to the project planner/scheduler, D/PMR and Deputy Project Manager. The Peer Review Plan can be an e-mail outlining:
  - a. Purpose of the Peer Review
  - b. Peer Review Members and current assignments
  - c. Estimated number of hours for Peer Review preparation, meetings and findings/recommendations preparation (if the review is funded by the project)
  - d. Data products requested in advance of the review
  - e. Date of review meeting (coordinated with the project)
  - f. Due date for out-briefing report to the project team – a face-to-face meeting to discuss the findings is preferred over a formal written report
4. Receive data products for review by the Peer Review members:
  - a. Project IMS
  - b. Supporting contractor / partner IMSs
  - c. Givers/Receivers List (if available)
  - d. Schedule Management Plan
  - e. Results of schedule risk analysis, health checks, Standing Review Board Programmatic Assessment Group findings, Government Accountability Office schedule audits, etc.
  - f. Work Breakdown Structure and dictionary
  - g. Project Plan (if available)
  - h. Project risk register
  - i. List of potential project descopes (if available)
  - j. Most recent Monthly Status Review
5. A kick-off meeting / project briefing is recommended to acquaint the Peer Review members with the project background and schedule objectives
6. The Peer Review team members review the IMS and other data products
7. The Peer Review Chair requests additional data or clarifications from the project if needed
8. The Peer Review team should meet and discuss their initial individual findings and conduct ongoing meetings to integrate their findings and recommendations
9. Chair prepares Peer Review briefing including findings and recommendations
10. Peer Review findings and recommendations briefing charts are delivered to the project team 2-3 days before the briefing
11. The goal is to conduct the Peer Review briefing of findings and recommendations with the project team no later than three weeks after the kick-off meeting with the project

**Objective:** To expand knowledge sharing across projects and increase consistency in use of practices in developing quality IMS

- Aids in evaluating project's IMS and associated schedule management processes
- Leverages the cadre of experts around Center for support/skills
- Supports interaction and exchange of tips and lessons
- Serves as a quality assurance review
- Employed to maintain standards of quality, improve performance, and provide credibility in terms of the IMS

#### LCRD Payload Schedule Peer Review Findings and Recommendations

January 25, 2013

Walt Majerowicz  
Jim Perry  
Lynn Wyatt

**IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL**

**BCI: EVM FOCUS**

**Objective:** Increase EVM use and consistency for better tracking through improvements in various elements (tools, process, policy, training, and reporting)

**POLICY**

- Provide Center response to NASA HQ requirements
- Prepare internal guidance for projects to navigate policy and approach

**COMPLIANCE**

- Integrated Baseline Reviews/ Surveillance Reviews
- Key Decision Point reviews
- Contractor reviews

**TOOLS**

- Tool training development and implementation
- Generate and install hardware and software requirements



**Earned Value Management System**

**REPORTING**

- Improve published reporting requirements
- Update MSR
- Create reporting users guide

**TRAINING**

- Identify available training
- Identify training needs of workforce
- Tailor EVM training to projects life cycle and workforce

## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

# EVM EXAMPLE: TRAINING LANDSCAPE EVALUATED AND EXPANDED

**Objective:** Design EVM training that supports the skills needed by project teams and identify the tool-based and analytical EVM learning that project teams and stakeholders require

1	Setting up a baseline (and linking it to the schedule, risk and budget)
2	Developing the WBS
3	Work Authorization creation and maintenance
4	Understanding the proper EVM language for solicitation clauses, DRDs and contracts
5	Linking award fee to performance, including prohibition against using CPI and SPI in PEP
6	Understanding how EVM and the Performance Measurement Baseline relate to the Project Management Agreement, Project Baseline, PPBE budget/operating plan, replans, rebaselines, revisions and Over Target Baselines (7120.5)
7	Managing changes in the baseline
8	Understanding the formulas and the products (basic data analysis)
9	Reporting EVM status to Management (which charts, how to concisely interpret and explain)
10	Interpreting EVM charts and data
11	Integrating EVM analysis with schedule and budget analysis, including CPM analysis
12	Using EVM data to forecast the project's or contract's final cost at completion.
13	Using basic EVM concepts and terminology, and knowing how to interpret EVM reports and graphs.
14	Reserved for future additions
15	Ability to use EVM tools (w/insight, MPM, any others)
16	Reserved for future additions
17	Reserved for future additions
18	Reserved for future additions
19	Reserved for future additions
20	Recognizing the significance of variances from the baseline and explaining variances
21	Establishing and managing over target baselines and over target schedules
22	Resource loading
23	Understand basic planning/scheduling techniques and schedule communication tools
24	Understand how to use formulas or advanced analytical technique beyond the basic EVM formulas for CPI, SPI, TCPI, EAC, etc
25	Contractor system descriptions and their importance to the project team

**EVM Skill Inventory**

	Acquisition Strategy Meeting (ASM)	Mission Concept Review (MCR)	System Requirement Review (SRR)	System Definition Review (SDR)	Preliminary Design Review (PDR)	Monthly Status Review (MSR)	Standing Review Board (SRB)	Project Integrated Baseline Review (Project IBR)	Contract Request for Proposal (Contract RFP)	Contract Award	Contract Integrated Baseline Review (Contract IBR)	Inspector General (IG)/ Government Accountability Office (GAO) Review or Audit
Project Manager and Senior Technical Business Manager and DPM/R	4.5,13,25,37,38	6,13,40			3,8,12,21,37,38,40	9,11,12,20,33,38,36,41	8,32	9,11,40	3,4,5,37	7,8,10,21,25,26,30,31	10,11,25,33	8,9,12,40
Financial Manager	4,13,23,25,38	6,13,40	15	27,28,29,34,35	1,3,8,12,21,22,24,37,38,40	9,11,12,20,33,38,36,41	8,32	9,40	3,4,39	7,8,10,21,25,26,30,31	10,11,25,33	40
Schedule Manager and Project Support Manager	4,14,23,25	2,6,13	15	27,28,29	1,3,8,12,21,23,24	9,11,12,20,33,36,41	8,32	9,11	4,39	7,8,10,21,25,26,30,31	10,11,25,33	
Product Development Lead (PDL)/ Subsystem Manager/IM Contracting Officer	4,5,13,25,38	2,6,13	15	27,28,29	1,3,8,12,24	9,11,12,20	8,32	9,11	3	7,8,10,21,25,26,30,31	10,11,25	
COTR	4,5,13,25,38		15		3,8,22,24	9,11,20	8	9,11	3,4,5,39	7,8,10,21,25,26,30,31	10,11,25,33	
Task Monitor	4,13,23,25			27,28,29	3,8,22,23,24	9,20	8	9	3,4,39	7,8,10,21,25,26,30,31	10,25	
Resource Analyst, Project Support Specialist (Staffing) and EVM Specialist	38,23	13,40	15	29	1,3,8,12,22,23,24,40	9,11,12,20,33,6,41	8	9,40	3	7,8,10,21,25,26,30,31	10,25	
Schedule Analyst	23	13	15	27,28,29	1,8,12,22,23,24	9,11,12,20	8	9		7,8,10,21,25,26,30,31	10,25	
Risk Manager		6,13								7,8,25	10,25	
Code 400 Leadership Team	32	6,13,40			32	32,33,36,41				30,31	33	8,9,12,32

**EVM Skill Analysis: Requirement by Major Milestone**

**Other Artifacts Include:**

- Course listings by project milestones
- Training concept document designs

- Curriculum design framework
- Skill requirement identification and assessment questions

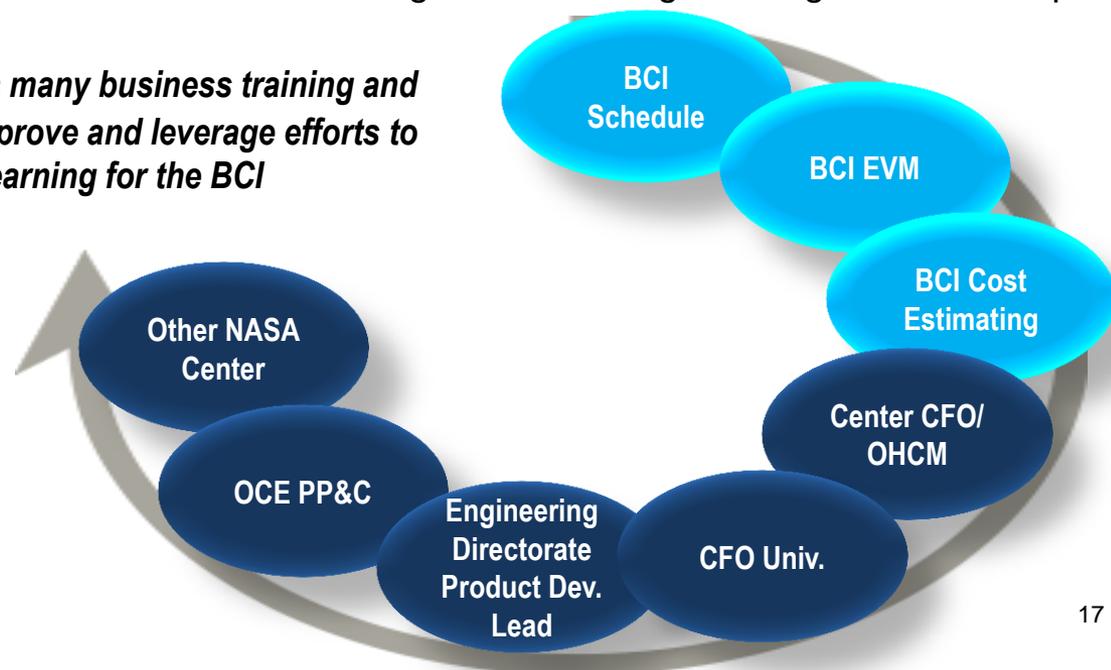
## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

### BCI: KNOWLEDGE MANAGEMENT AND SKILL DEVELOPMENT

**Objective:** Develop and enhance career development and informational tools to better align skills & resources and increase PP&C knowledge sharing

- **B** usiness      Focuses on all PP&C and business functions that affect projects
- **R** apid            Pursues 5-10 actions per year based on priority needs and quick results
- **I** nformation      Focuses on improvements to information access or communications
- **S** kills             Supports career development efforts (e.g., training, career pathways)
- **K** nowledge       Improves repositories and facilitates using true Knowledge Management techniques

***BRISK** is collaborating with many business training and learning organizations to improve and leverage efforts to provide optimal learning for the BCI*



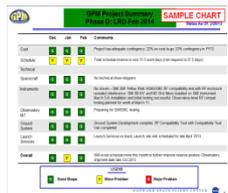
## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

### BCI PHASE I ACCOMPLISHMENTS



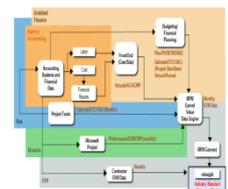
#### SCHEDULING

- ✓ Developed and deployed a Schedule Management PG
- ✓ Identified and created 30+ planning and scheduling BPIs
- ✓ Built a Planning and Scheduling Knowledge Network (SharePoint)
- ✓ Coordinated collection for development of a project portfolio IMS



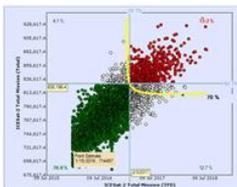
#### MANAGEMENT REPORTING

- ✓ Revised the Directorate-level and Center-level MSR guidance
- ✓ Streamlined the collection and reporting of the Center's Top 10 Issues report for programs and projects



#### EVM

- ✓ Assessed and defined the As-Is Goddard EVM System Architecture
- ✓ Designed an EVM Training Curriculum Concept Document
- ✓ Coordinated and distributed EVM templates for project performance reporting
- ✓ Streamlined the acquisition process for GSFC-wide EVM software

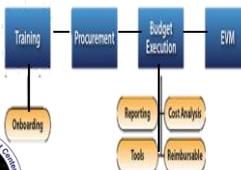


#### COST ESTIMATING

- ✓ Employed a reliable framework for conducting JCL model assessments at Goddard, operating consistently over the past 12 months
- ✓ Wrote and released a JCL Handbook for Goddard

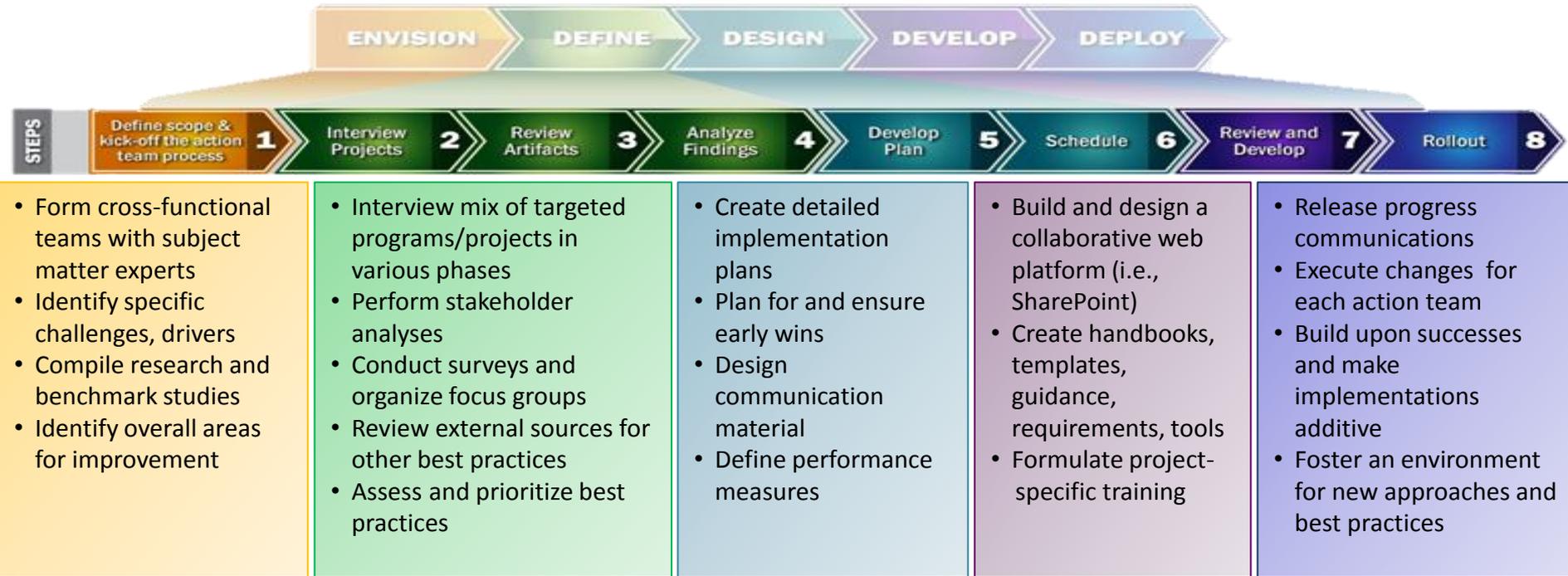
#### BRISK

- ✓ Re-constituted a Combined Resources Forum to share learning, knowledge among community
- ✓ Designed curriculum and helped train ICESat-2 to assist in successful execution of EVM
- ✓ Organized and updated the GSFC's Professional Intern Program (PIP) Repository
- ✓ Extended training on Budget Execution, Planning and Scheduling for Resources Analysts, and Product Development Lead Training



## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

### BCI LESSONS AND NEXT STEPS



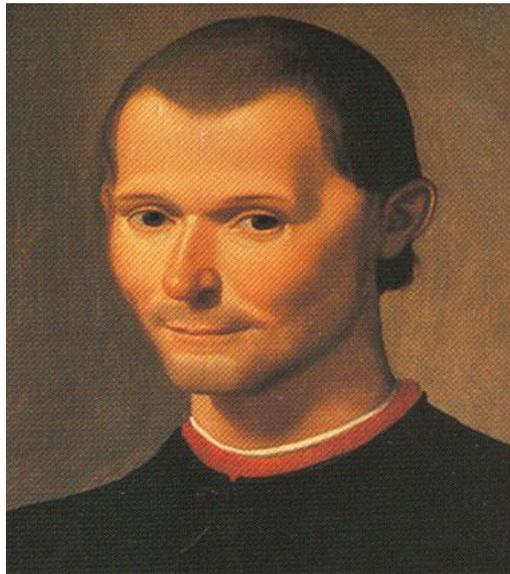
Moving forward, FPD is continuing in the identification and deployment of changes to our PP&C methods and tools, collaborating with others and adjusting as appropriate. Ongoing efforts include:

- Continuing to roll out changes across the five action teams; completed Phase I in June and moving forward with Phases II and III
- Soliciting feedback and adjusting changes as needed
- Creating an environment to enable adoption of new approaches yet ensuring these approaches are anchored in our business and support sharing across programs/projects
- Collaborating to identify additional best practices and improvements

## IN THE DRIVER'S SEAT: PROGRAM PLANNING AND CONTROL

---

### CLOSING



Niccolo Machiavelli

Florence, Italy circa 1509

*It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage, than the creation of a new system.*

*For the initiator has the enmity of all who would profit by the preservation of the old institutions and merely lukewarm defenders in those who would gain by the new ones.*

HUMAN EXPLORATION & OPERATIONS  
MISSION DIRECTORATE



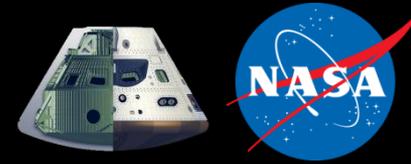
# Orion PP&C

## *PM Challenge 2013*

Lucy V. Kranz, Manager  
Orion Program Planning & Control  
July 10, 2013

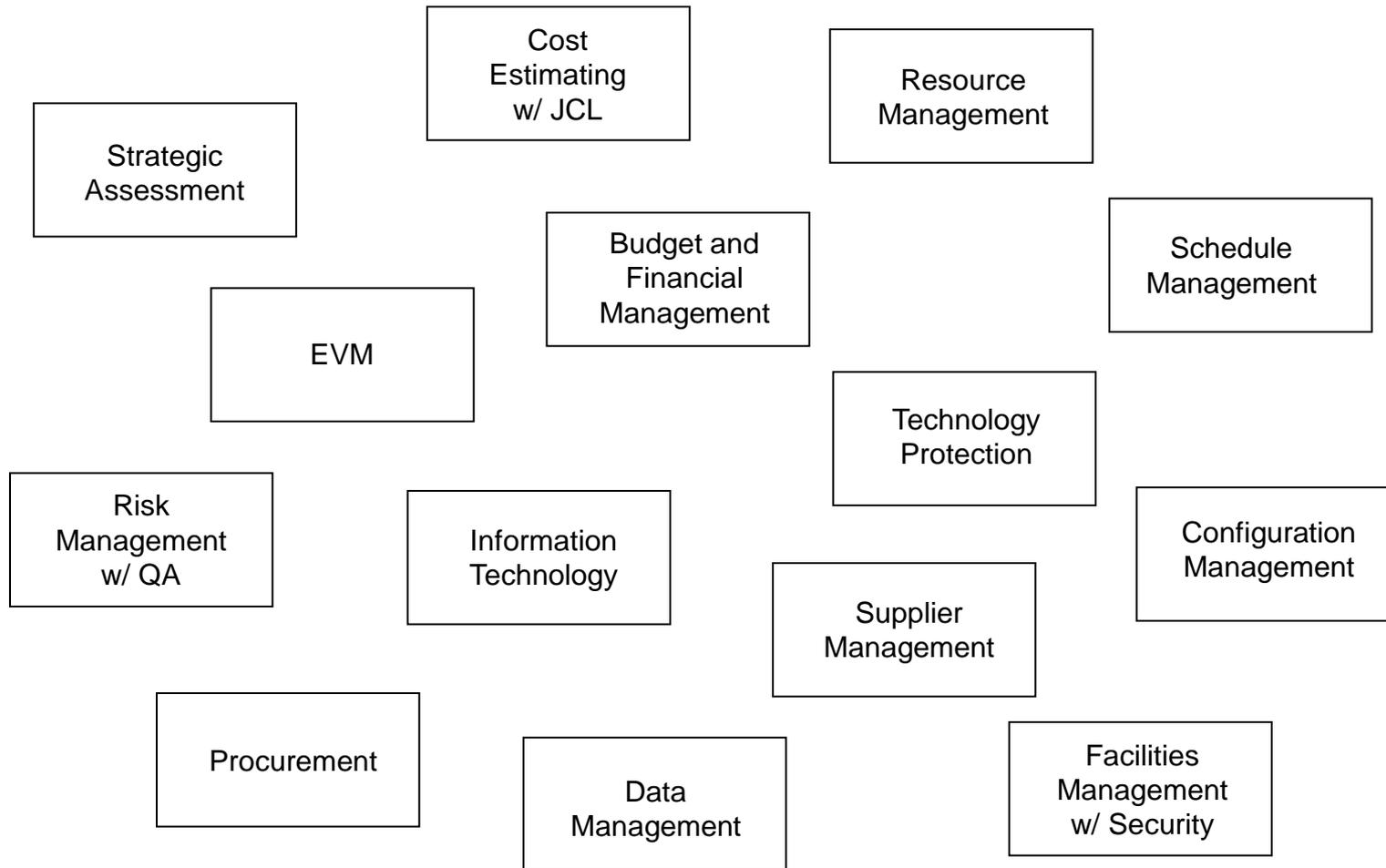
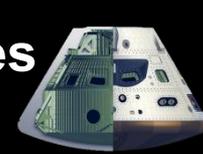


# PP&C is a Subset of The Program Manager's Responsibilities

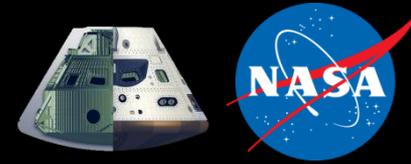


	Program Manager
Concept Studies	<ul style="list-style-type: none"> <li>• Initiate, support and conduct program-level concept studies consistent with direction and guidance from MDAA</li> </ul>
Budget and Resource Management	<ul style="list-style-type: none"> <li>• Implement program consistent with budget</li> <li>• Develop cost estimates for components</li> <li>• Develop workforce and facility plans</li> <li>• Manage program resources</li> <li>• Provide annual program budget submission input</li> <li>• Support development of the Agency Baseline Commitment (ABC)</li> </ul>
Program Plans	<ul style="list-style-type: none"> <li>• Develop and approve program plan</li> <li>• Execute program plan</li> </ul>
Performance Management	<ul style="list-style-type: none"> <li>• Assess program technical, schedule and cost performance and mitigate risks</li> <li>• Provide data to support the monthly BPR process and report on performance</li> <li>• Communicate program performance, issues and risks to Center and Mission Directorate management and present recovery plans</li> </ul>
Life Cycle Reviews	<ul style="list-style-type: none"> <li>• Prepare for and provide assessment of program and readiness to enter Implementation</li> </ul>

# 'Traditional' PP&C is a Flat Organization of the Disciplines Performing the Work each with its own unique tool set



# Traditional PP&C Approach was not Meeting Orion Project Needs



FY2009: What is our status? Where are we headed? Will we meet our commitments? (1)

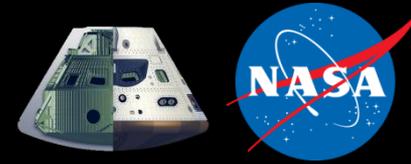
- FY2010:
- Constellation Program Cancelled
  - HQ-directed budget cuts
  - Budget for Orion PP&C work cut 30%

- FY2011:
- Orion Project becomes Orion - MPCV Program
  - Program funded at ~70% Orion Project value
  - NASA Administrator commits to affordability (2)
  - PP&C budget cut an additional 20%
  - Took on cross-program integration

(1) Statement made by the Orion Project Manager following a two-day management review consisting mostly of activity reports and data dumps

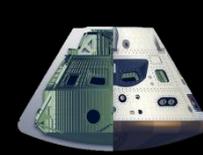
(2) Statement of the Honorable Charles F. Bolden Jr. Administrator NASA before the Committee on Science, Space and Technology, U S House of Representatives, July 12, 2011

# Orion PP&C Re-engineered its Approach to Enable Performance Management



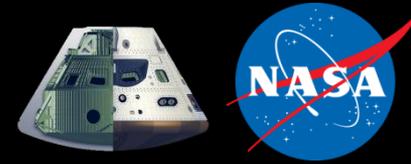
- FY2010:
  - Studied PP&C to determine how to improve performance and to operate at a reduced level of funding
  - ***Shifted from a service-based function providing data reports to a product-based analytical function providing information***
  - Termed the shift “Next Generation”
- FY2011:
  - Re-organized Orion PP&C to implement Next Generation PP&C system
- FY2012:
  - Re-competed the Orion integration contract to implement Next Generation PP&C approach
- FY2013:
  - Awarded a new contract
  - 15% cost reduction with 1.5% to 3% annual cost avoidance
  - Process Improvement and Affordability Panel

# The Lessons Learned are Fundamental Principles for Orion Program Performance Management



<ul style="list-style-type: none"><li>• The work performed is not the same as the disciplines/tools used to perform the work</li><li>• Data reports do not provide actionable information; the recipient must 'connect the dots'</li></ul>	Chart 6
<ul style="list-style-type: none"><li>• PP&amp;C work is a cycle of interacting, interrelated and interdependent functions; i.e., a system</li></ul>	Chart 7
<ul style="list-style-type: none"><li>• There are only three independent variables: cost, schedule and technical</li><li>• The relationship between the three variables is planned by management and not mathematical</li><li>• The environment where management occurs can be represented as a 'trade space'</li></ul>	BU Chart 1
<ul style="list-style-type: none"><li>• A Program Manager manages the three variables in accordance with the Program and Execution Plans to achieve the required outcome</li></ul>	BU Chart 2
<ul style="list-style-type: none"><li>• EVM is a performance measure that is input to Performance Management</li></ul>	BU Chart 3
<ul style="list-style-type: none"><li>• Definition and documentation are fundamental to communication and understanding</li></ul>	BU Chart 4

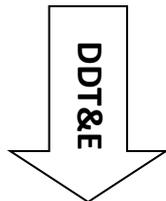
# PP&C Work uses Disciplines and Tools to Provide Actionable Information



- The work performed is not the same as the disciplines/tools used to perform the work
- Data reports do not provide actionable information; the recipient must 'connect the dots'

## Work

- Document Baseline
- Plan Work
- Acquire Resources
- Manage & Control Data
- Manage & Control Change
- Manage Performance
- Report Performance

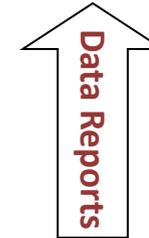


## Variables

- Cost
- Schedule
- Technical



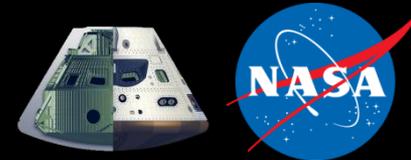
## Information



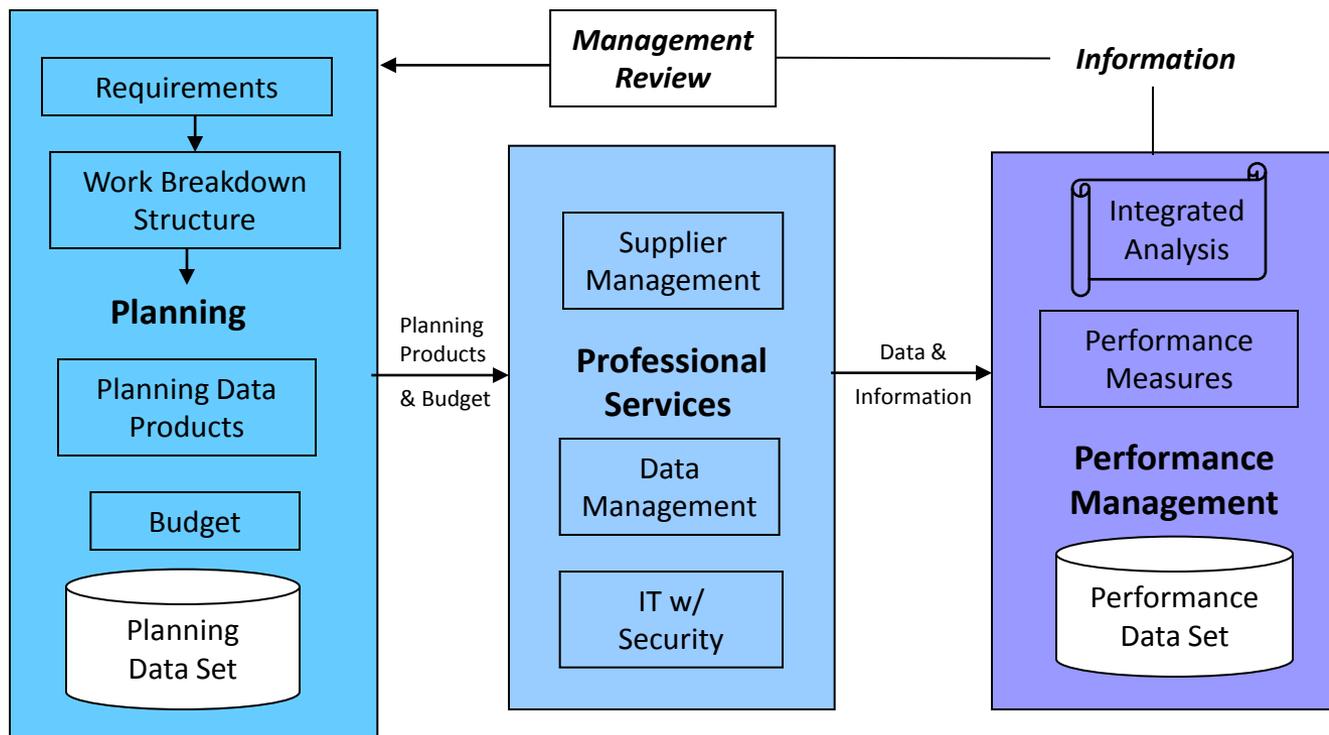
## Discipline/Tools

- Budget Processes
- Configuration/Data Management
- Cost Estimating
- Integrated Master Schedule
- Earned Value Management
- Financial Management
- Information Technology
- Joint Confidence Level
- Procurement
- Risk and Quality Management

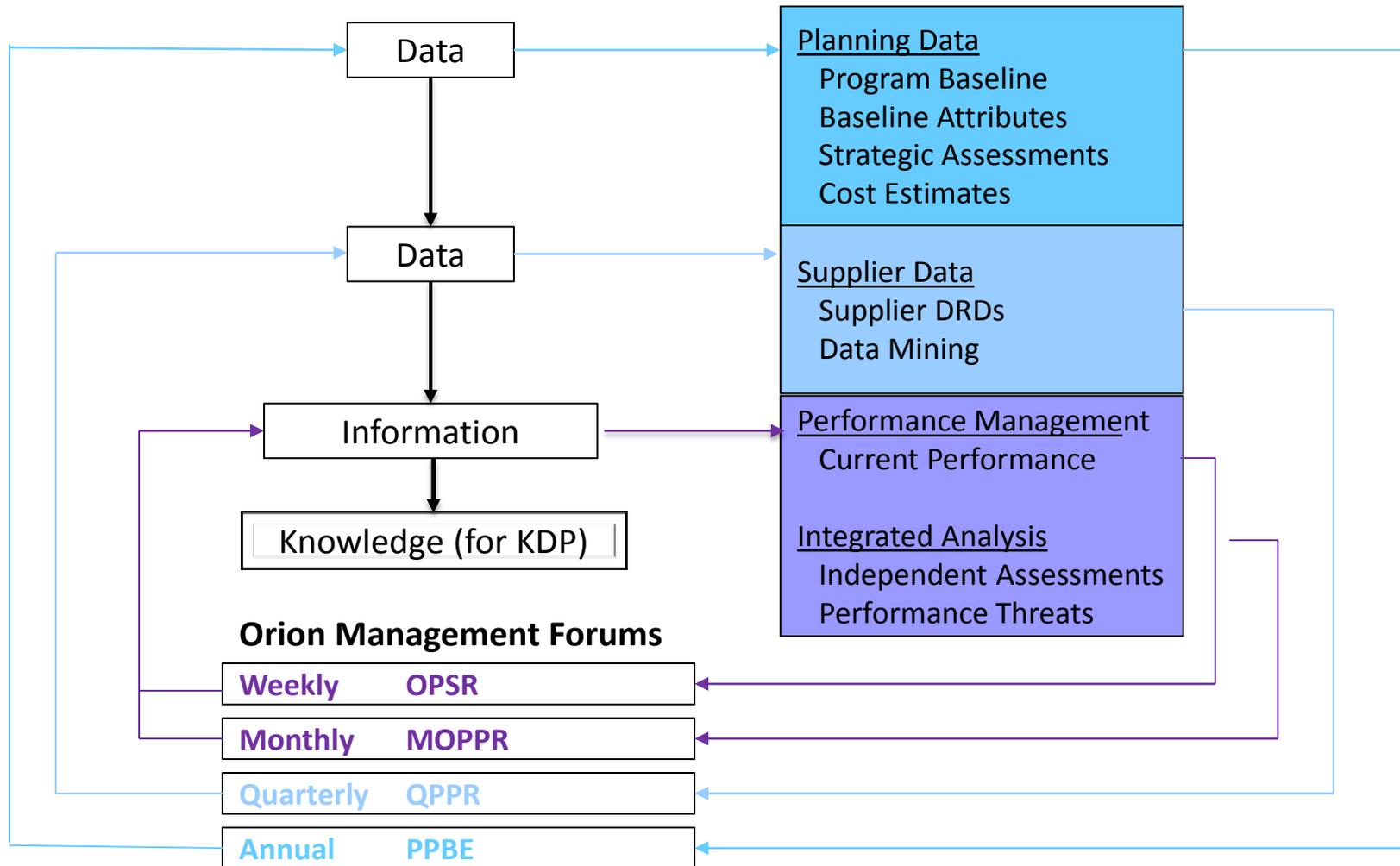
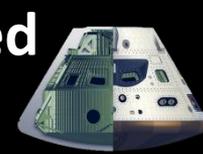
# PP&C Work is a System



- PP&C work is a cycle of interacting, interrelated and interdependent functions; i.e., a system



# Near Real-Time Performance Management is Performed Weekly, Monthly, Quarterly and Annually



# Program Planning and Control (PP&C) Agency Working Group

## PP&C Working Group Primary Members

Affiliation	First Name	Last Name
DFRC	Robert	Binkley
SAWGW, IPAO	Hiedemarie	Borchardt
MSD, OHCM	Erica	Bovaird
OCT	Faith	Chandler
LaRC	Yvonne	Dellapenta
JPL**	Daniel	Graham
MD, HEO	Cris	Guidi
ARC	Greg	Josselyn
EVMWG, OCE	Jerald	Kerby
KSC	Maria	Lopez-Tellado
JSC	Glenn	Lutz
STMD	Wade Russell	May
Chair, OCE	Rob	Moreland
CAWG, OOE	Eric	Plumer
MSD, Procurement	Ronald	Poussard
SSC	Ben	Powell
GRC	Kirk	Seablom
GSFC	Stephen, A	Shinn
SEWG, OCE	Joe	Smith
MSFC	Johnny	Stephenson
PP&C CoP, OCFO	Mary Beth	Zimmerman

## PP&C Steering Committee

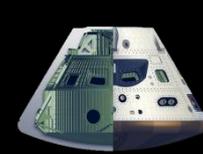
Affiliation	First Name	Last Name
HEO	Daniel	Dumbacher
OCFO	Andrew	Hunter
SMD	Roy	Maizel
Ofc of Evalutaion	Janet	Petro
OCE	Mike	Ryschkewitsch
Chief, Saftey & Mission Assurance	Terrence	Wilcutt

## PP&C Working Group Alternate Members

Affiliation	First Name	Last Name
LARC	Rebecca	Bales
GSFC	Jonathan	Bryson
JSC	Cathy	Claunch
JSC	Dennis	Davidson
MD, HEO	Stephan	Davis
LARC	Kathy	Ferrare
MSFC	William	Hicks
GRC	Lisa	Hicks
HQ	Charles	Hunt
EVMWG, OCE	Kristen	Kehrer
LARC	Barbara	Mobley
LARC	Amy	Radford
JPL	Kevin	Rice
STMD	Jan	Rogers
KSC	Ines	Salcedo
OCE	Barmac	Taleghani
OCT	tbd	tbd
MSD, Procurement	Carl	Weber

## PP&C Contributing Members

Affiliation	First Name	Last Name
ARC	Kaitlyn	Hemingway
GRC	Bob	Sefcik



## Virtual PM Challenge, Session #3

In the Driver's Seat: Program Planning and Control

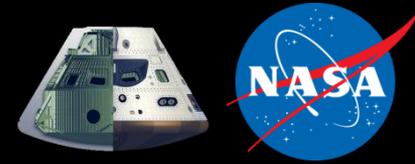
**QUESTIONS?**

# Upcoming Webcast

**Title:** Master's Forum

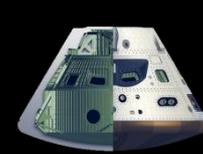
**Date:** August 7, 2013

Check PM Challenge website for latest information



# Back-Up Charts

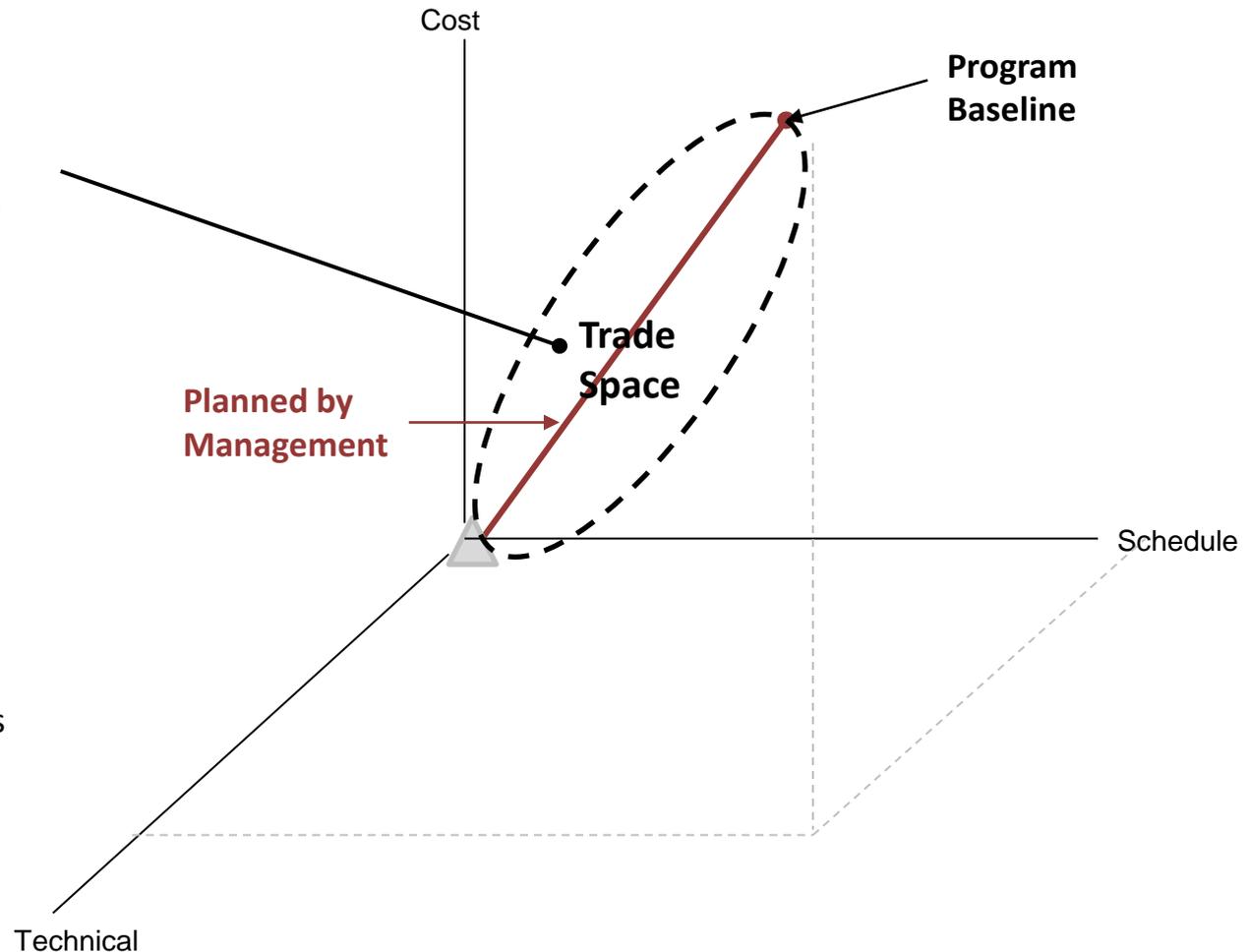
# PP&C Planning Function Establishes the Trade Space



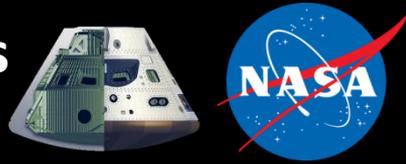
- There are only three independent variables: cost, schedule and technical
- The relationship between the three variables is planned by management and not mathematical
- The environment where management occurs can be represented as a 'Trade Space'

## Planning Products

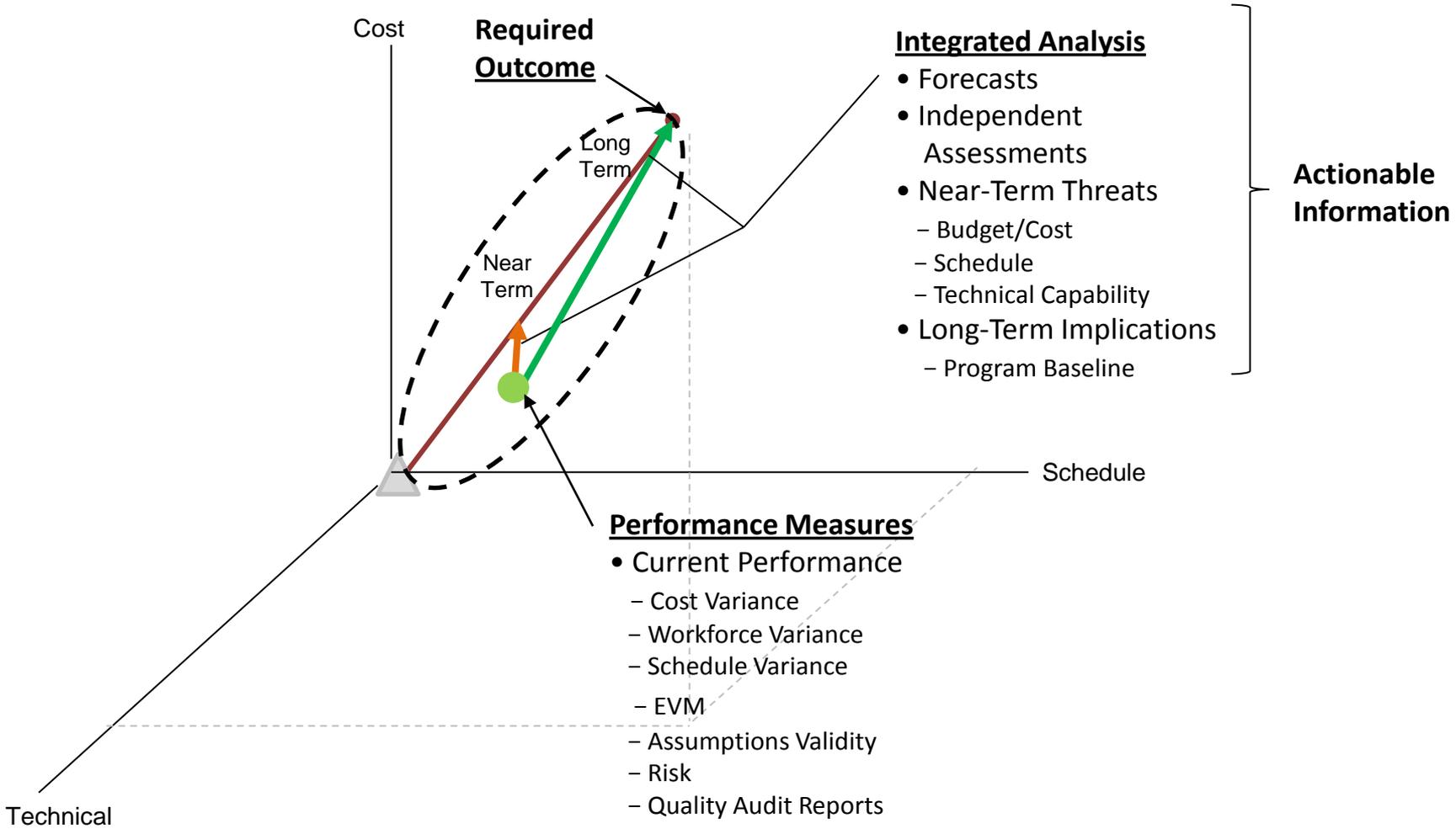
- Program Baseline
- Strategic Assessments
- Baseline Attributes
  - Program Plan
  - Execution Plan
  - Master Schedule
  - CAM Schedules
  - Product schedules
  - Analysis schedules
  - Milestones & Events
  - Risk
  - Assumptions
- Contractor Baseline
- Cost Estimates
- Controlled Documents



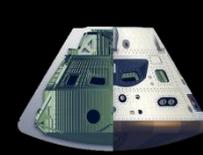
# PP&C Performance Management Function Characterizes Performance and Provides Actionable Information



- The Program Manager manages the three variables in accordance with the Program and Execution Plans to achieve the required outcome



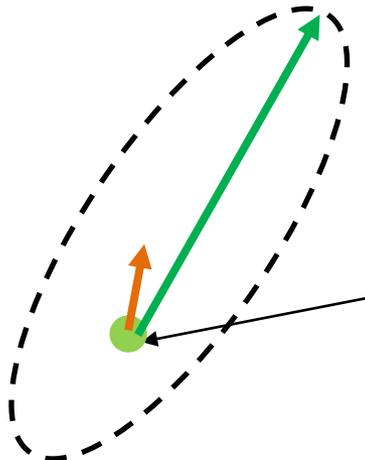
# EVM is one of Many Performance Measures for Orion Performance Management



- EVM is a performance measure that is input to Performance Management

White Paper: Orion MPCV Performance Management

*The Orion MPCV Program will report EVM at the Program level. The Agency Baseline Commitment includes the Performance Measurement Baseline for EVM computations for both Prime and Non-Prime content.*



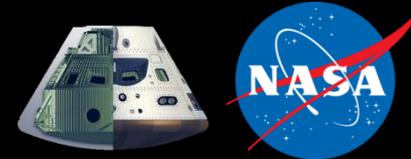
## Performance Management

- **Performance Measures**
  - Cost Variance
  - Workforce Variance
  - Schedule Variance
  - **EVM**
    - Assumptions Validity
    - Risk
    - Quality Audit Reports
- **Integrated Analysis**
  - **Near-Term Threats**
  - **Long-Term Implications**

## Agency Baseline Commitment

Agency UFE
Program UFE
Non-Prime Content: Agreement Budget
Prime Content: Contract Budget

# Orion-MPCV Program Has Fully Documented Its Approach to PP&C



- Definition and documentation are fundamental to communication and understanding

Presentations	White Papers	Briefings
Supplier Management	Concept of Operations	PPMD Training 2010
Complexity	Program Control Processes	PA&E Briefing
Existing Operations	Approach to PP&C	Comparative Analysis
Body of Knowledge	The Learning Curve	SMC Briefing
Causal Analysis	Affordability	Orion Project Manager's Briefing
Systems Thinking	<b>* Glossary</b>	ESD Briefing
The PP&C Problem	<b>* PP&amp;C Requirements</b>	CMC Briefing
What & Who	Performance Management	OCE Briefing
Implementation Plan	PM Model (MPCV and ESD)	Industry Day Briefing
Future PP&C Operations	Thoughts on Modeling	MPIC Briefing
Trade Space	<i>Thesis Statement (in work)</i>	Next Generation Quick Look

**\* Handouts**