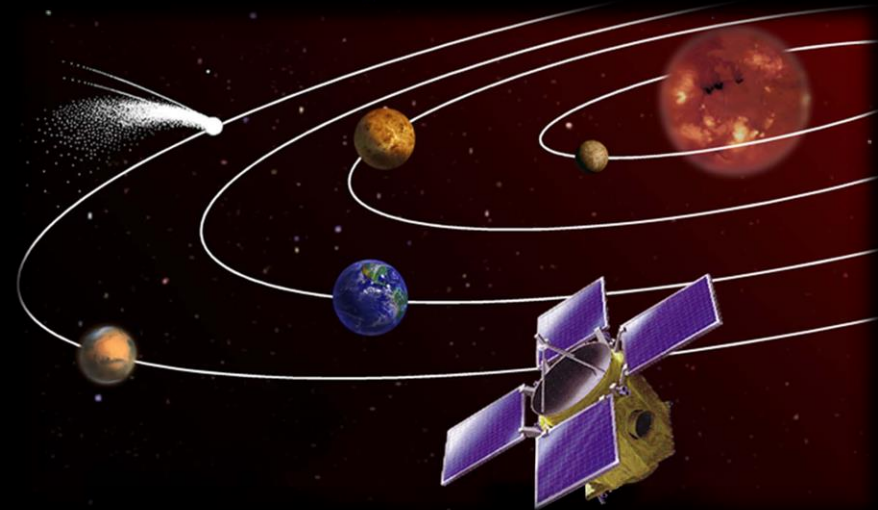
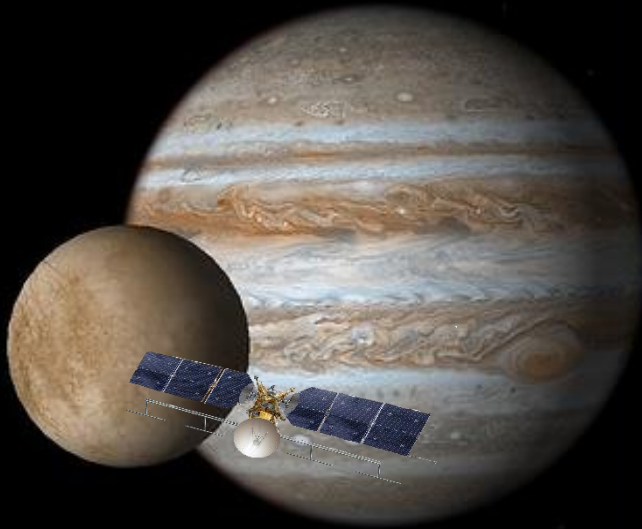
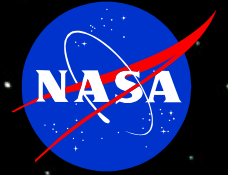



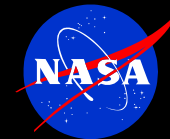
National Aeronautics and
Space Administration



New Frontiers 4 Concept Study Kickoff

Planetary Missions Program Office

Planetary Missions Program Office



Science Mission Directorate
Associate Administrator Thomas Zurbuchen
Deputy AA Dennis Andrucyk

Planetary Science Division
Director Jim Green
Deputy Director David Schurr

Planetary Missions Program Office

Program Manager Brian Key (acting)
Deputy Manager Brian Key



MESSENGER InSight
Dawn Lucy
LRO Psyche
Strofió MEGANE



New Horizons
Juno
OSIRIS-REx



Europa Clipper
JUICE
DART



Program Attributes

Discovery	New Frontiers	Solar System Exploration
Established in 1992	Established in 2003	Established in 2014
Competed through an Announcement of Opportunity	Competed through an Announcement of Opportunity	May be Strategic (Directed) or Competed
PI led; Projects managed by the Jet Propulsion Laboratory, Johns Hopkins University Applied Physics Laboratory, Goddard Space Flight Center, and Southwest Research Institute	PI led; Projects managed by the Jet Propulsion Laboratory, Johns Hopkins University Applied Physics Laboratory and Goddard Space Flight Center	PM or PI led; Projects managed by the Jet Propulsion Laboratory, Johns Hopkins University Applied Physics Laboratory and Southwest Research Institute
\$450M (FY15\$) PI-managed development cost cap	\$850M (FY15\$) PI-managed development cost cap	Missions vary from small to large; and focused to complex depending on mission goal/type
Launch every 36 months (with a goal of 24 months); Typically 35 months from start of implementation until launch	Launch every 60 Months (with a goal of 48 months); Typically 51 months from start of implementation until launch	Mission frequency and life-cycle costs will be dependent on the program budget profile



Program Office Background

- Discovery and New Frontiers Program Office assigned to the Marshall Space Flight Center (MSFC) in August 2004; Lunar Quest Program added in 2008
- Significant participation from Headquarters + NASA field Centers
- Lunar Quest Program was terminated for FY15
- Office was renamed the “Planetary Missions Program Office” after consolidating the management of all programs into a single structure represented in the current Program Plan; October 2014
- Solar System Exploration Program was added in February 2015

Program Office Goal

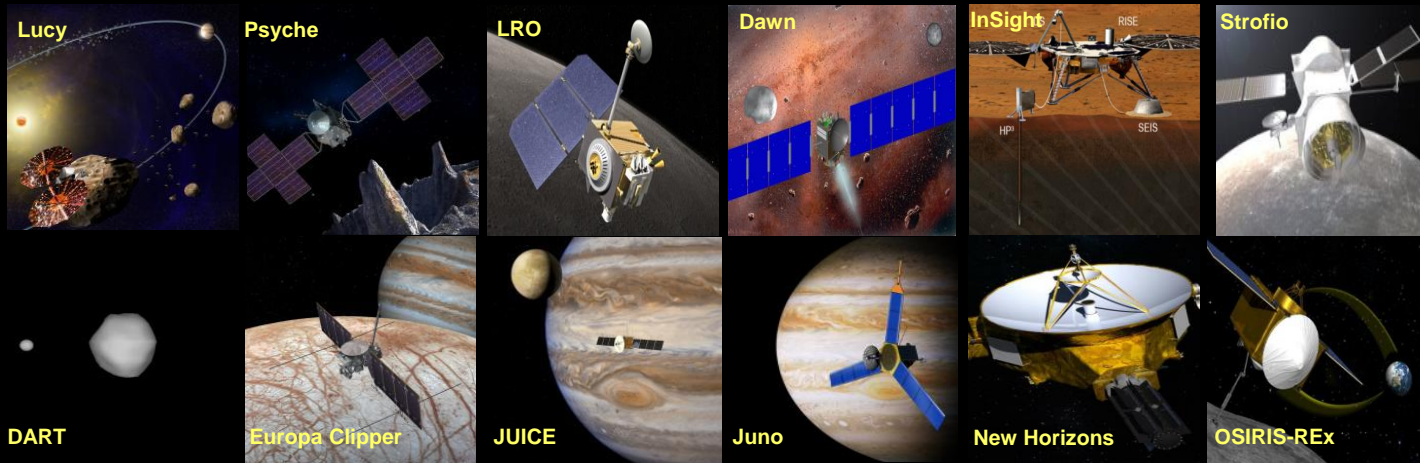


Goal

- Enhance the probability of mission success of missions through independent oversight and insight through all phases of the mission life cycle utilizing a high-powered, effective, and efficient team

Success is.....

- Delivering Mission Science to the Principle Investigator
- Ensuring the implementing organization's success in delivering the spacecraft on cost and schedule (meet the launch date and cost cap)
- Meeting the Program launch frequency for Science Missions





Program Office Philosophy

Approach

- **Shared partnership for mission success with Headquarters and project teams. Right level of Government involvement to mitigate program risk**

Relationships

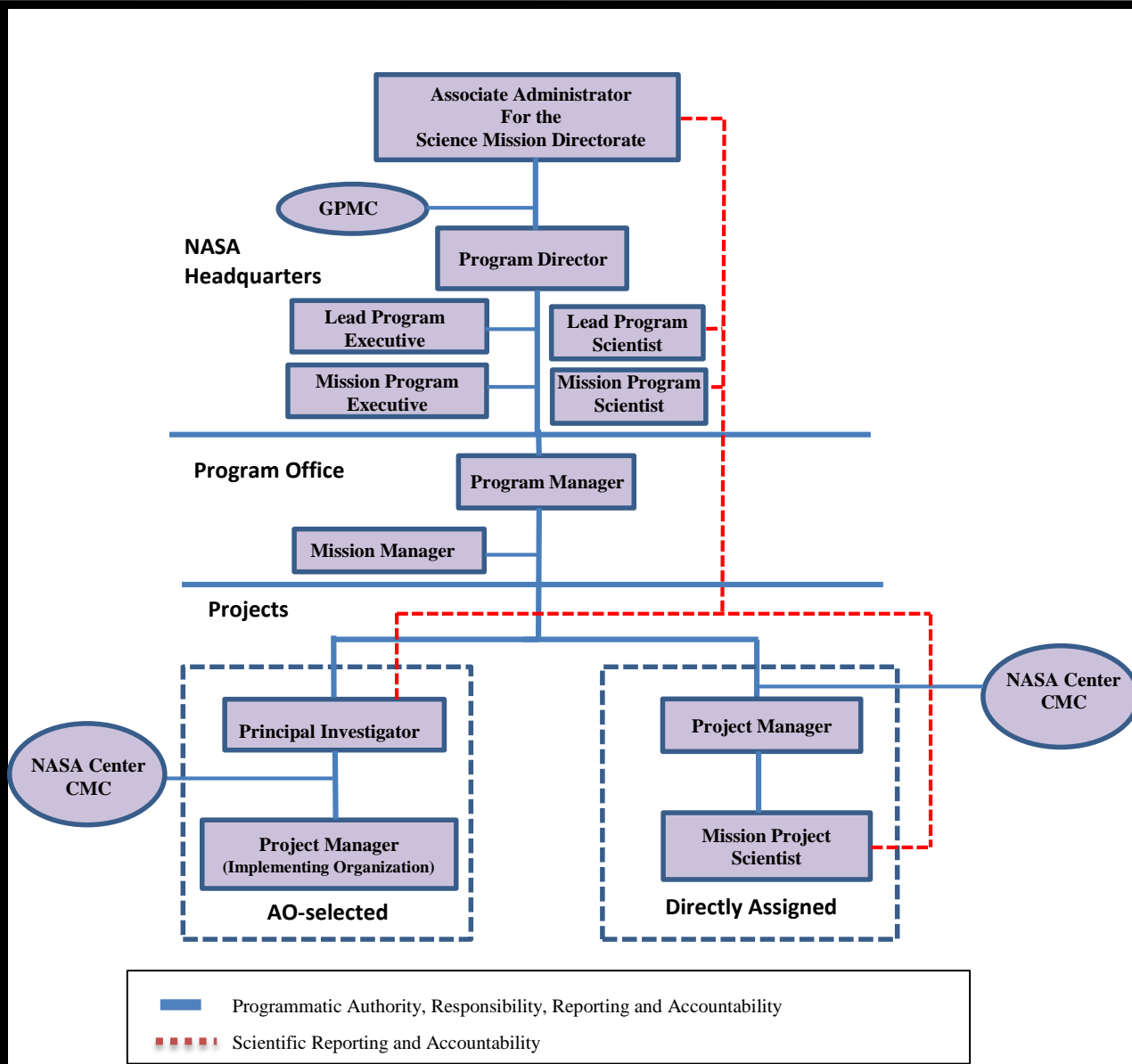
- **Role: Implement our role as a program office, while recognizing the responsibility and authority of the projects and institutions**
- **Fairness: Operate with integrity and fairness at all times with all parties**
- **Trust: We will approach new relationships with an attitude of trust**
- **Respect: Recognize the dedication and capability of the PI/project teams, especially during times of problems**



Program Office Primary Responsibility

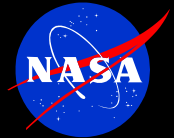
- **Implement 7120.5 Program Management functions**
 - Split responsibility between the PSD Program Director and MSFC Program Manager
 - Program Manager involvement dependent on mission selection
 - AO selected missions; involved in Phases B-F (SOMA supports HQ in earlier phases)
 - Directed missions; involvement begins in Pre-Phase A and continues through Phase F
- **Perform oversight and insight of projects (budget, schedule, technical and risks);** When, where and how deep to penetrate determined by assessment of risks and modulated by available budget
- **Manage program budgets**
 - Independently assess project performance to plan
 - Ensure projects receive required funding per plan
 - Manage PPBE process for projects within the programs, provide integrated assessment/recommendation to PSD
- **Administer contracts;** Execute Task Agreements with JPL, perform COR function on APL missions, and execute contracts with Principal Investigator institutions

Program Management Structure



Planetary Missions Program Office

Program Office Organization



Planetary Missions Program Office
 Program Manager Brian Key(Acting)
 Deputy Program Manager Brian Key
 Management Support Assistant Sandra Nixon
 Office Coordinator Shae Gibson

Program Integration
 Program Integration Lead Sherry Jennings (Acting)
 Integration Engineer Diane Vaughan
 Integration Engineer Marjie Davis
 Integration Engineer Detail Vacant (FTE)

Cost and Schedule
 Cost and Schedule Lead Belinda Wright (Acting)
 Cost Analyst Mahmoud Naderi
 Schedule Analyst John Ollie

Business Management
 Business Office Mgr. Donna Patterson
 Program Analyst Shawn Gardner
 Program Analyst Brandy Walker
 Program Analyst Andrea Green

Procurement
 Contract Officer/Mgr. Tyler Cochran
 Senior Contract Specialist Shaun Canter
 Contract Specialist Alfreda Zachery

Communication & Outreach
 C&O Lead Brian Mitchell
 C&O Support Stephanie Henry

Program Technical Support
 Chief Engineer, Tech Authority Keith Dill
 Technical Support Jay Kissell

Program Safety & Mission Assurance
 SMA Lead Mike Giuntini

Mission Managers
 Asst MM Detail Kevin Sykes

- Rick Turner
- Belinda Wright
- Sherry Jennings
- Keith Robinson
- Scott Bellamy
- Jimmy Lee
- Joan Hannan
- Brian Mulac
- Deputy (Vacant)

Discovery Missions
New Frontiers Missions
Solar System Exploration

- GRAIL
- InSight
- LRO Science Msn
- Psyche
- Lucy
- Dawn
- MESSENGER
- Juno
- OSIRIS-REx
- DART
- New Horizons
- Strofi
- JUICE PEP-Hi
- JUICE RIME
- JUICE UVS
- Europa Clipper
- Europa Lander



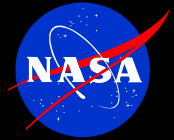
Program Office Roles

Direct Support

- Program Management
 - Responsible for managing the Program Office
 - Program Manager for the Programs
- Program Integration
 - Responsible for Program-level reporting and cross-cutting products
- Mission Managers
 - Primary Program interface with the Projects and Program Executives
- Education and Communications
 - Conducts Program-level Education and Communications activities
 - Supports Project activities

Matrix Support (All Co-located with Program Office)

- Technical Authority (TA)
 - Program Office holds TA for projects managed at non-NASA centers (e.g., SWRI, APL)
 - MSFC Engineering Directorate provides Chief Engineer
 - MSFC SMA Directorate provides Chief SMA Officer and SMA support
- Business Team
 - Maintain PBR's with projects and tracks project budgets
 - Develops PPBE submittals
 - Tracks Program budget
- Procurement
 - Contracting Officer for Program contracts



Program Office: *Mission Manager*

Key Roles and Responsibilities

- **Mission Managers (MM) function as the PMs day-to-day point-of-contact for all assigned projects, performing technical and programmatic management functions on behalf of the PM and ensuring the PM maintains an awareness of the project status. The MM responsibilities include:**
 - **Interface directly with the Project Managers to develop inputs for program planning and integration or to resolve project issues**
 - **Perform independent evaluation of project metrics, schedule, cost data, management, and issues for the PM**
 - **Perform independent assessments of projects to identify risks and mitigations**
 - **Serve as the Program Office advocate to NASA management, the public, and other Government entities for assigned projects**
 - **Lead the development of decision packages or products that are fully coordinated within the Discovery Program and with the related PIs and Project Managers**
 - **Ensure that appropriate program resources are provided to the projects in a timely manner**

Program Office: *Contracts/Business Management*



Key Roles and Responsibilities

Contract Management:

- Program Office manages contracts with Principal Investigator organization and implementing organization, if applicable
 - If the organization has an associated NASA Management Office (NMO) the contract is managed by the NMO with input from the Program Office on the project task
- Program Office provides Phase A contract support as a service to SMD, however the Program Office is not involved in the selection process

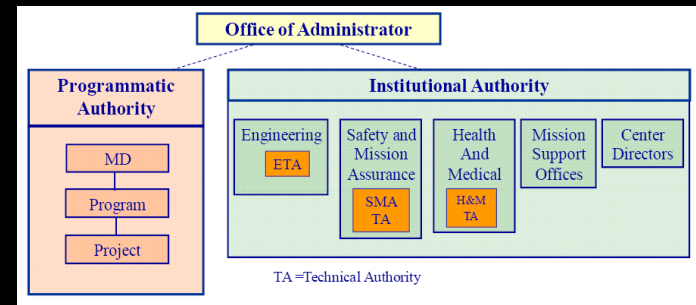
Business Management:

- Program Business Office coordinates the annual overall program budget planning activity in conjunction with all Discovery projects
 - Results are documented in a Program Funding Agreement with each Project
- Missions are required to provide standard NASA financial reports
- Missions are responsible for the overall project budget
 - Information on project by-pass funding (e.g. direct funding to NASA centers) is provided by the Program Office
- Missions are required to implement Earned Value Management – developed in phase B, utilized during phase C/D



Program Office: *Technical Authority*

- **NASA governance model provides a separation of Programmatic Authority and Institutional Authority as part of its system of “checks and balances” to provide independent oversight of programs and projects in support of overall safety and mission success**
 - **Engineering Technical Authority (ETA) is provided to the Program Office from the Chief Engineer’s Office at MSFC**
 - **Safety and Mission Assurance (S&MA) Technical Authority is provided to the Program Office from the S&MA Office at MSFC**
- **TA Communication**
 - **Daily verbal discussions with Mission Managers**
 - **Frequent discussions with Project Managers and Project personnel**
 - **Weekly written and verbal reporting to MSFC Management**
 - **Ad-hoc communication as necessary**
- **TA Insight**
 - **The Program TA ensures mission success by performing independent technical insight over the various projects within the Programs**
 - **The TA performs insight by 1) attending review meetings, 2) monitoring telecons, 3) reading status reports, and 4) following on-going issue resolutions**
 - **The level of insight is risk-based**
- **The PMPO CE utilizes technical expertise from across NASA, industry, and academia to study and address issues**





Program Office: *Risk Based Insight*

- Cost cap – cost constraint
- Planetary missions – schedule constraint
- Complex instruments/mission designs – technical constraints

- Program Office insight effort modulated by budgetary constraints

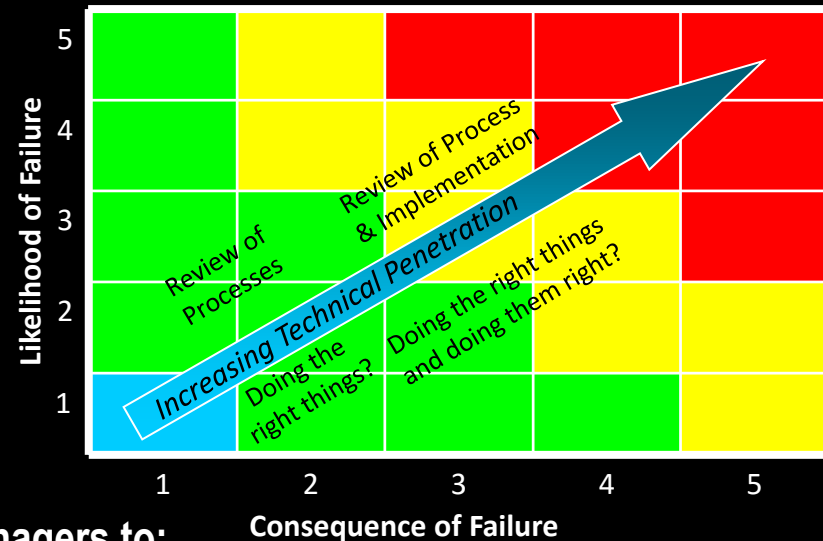
- Risk identification through multiple vehicles

- Formal project reporting
- Regular and gate reviews
- Regular interactions with project teams
- Input from Standing Review Boards

- Risk Management Process requires Mission Managers to:

- Assess and monitor resolution of project-identified risks and mitigations
- Independently identify and assess project risks and mitigations

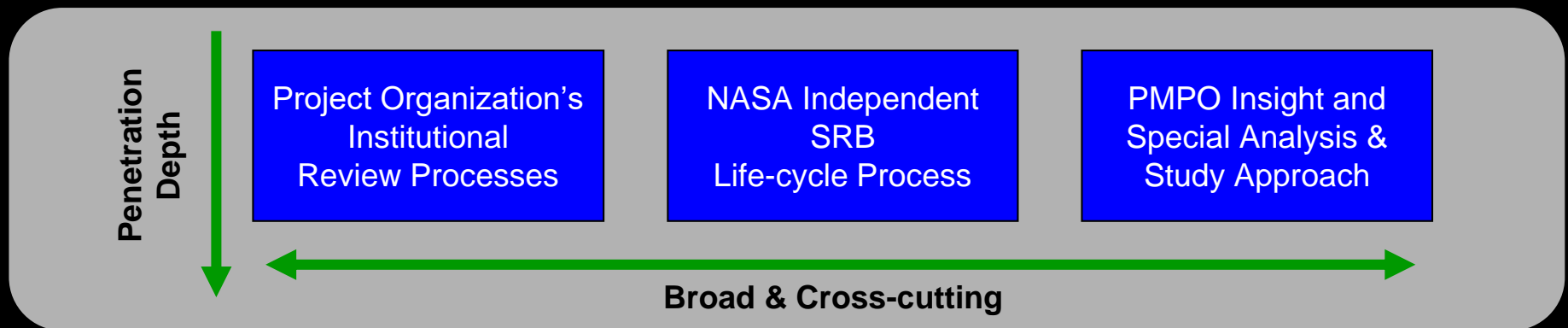
- Risk-Based Insight of projects, where depth of technical insight is applied proportionally to severity of known risks and within balance of total program's priorities and limited resources





Program Office: *Insight/Oversight Approach*

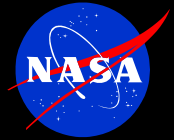
- PMPO “3-pronged” composite insight/oversight approach to achieving the “right-level” of review and analysis, expertise, and objectivity for enhancing probability of project and program success.
 - Adjust insight penetration levels as required by risk/technical severity
 - Broadly balance insight/oversight resources (e.g., processes, budget, schedule)
 - Leverage use of all existing insight/oversight capabilities within the implementing institution, NASA, and the program office





Program Office: *Project Schedule Assessment*

- **Projects in Phases B, C, & D independently maintain their detailed schedules and report on schedule performance monthly**
- **Mission Managers assess project schedules periodically**
 - **Program Office schedule analyst provides assessments to individual Mission Managers**
 - **Project schedules are included in monthly reports to the PM and NASA HQ/PSD**
 - **Risk management process identifies and tracks potential impacts to project schedules (and any associated impacts to cost)**
- **Detailed reviews of the project schedules are performed periodically**
 - **Coordinated with major project milestones or special program evaluations**
 - **Schedules assessed for completeness and feasibility**
- **Program Office schedule analyst uses various internally developed and commercially available software products and metrics to analyze project schedule performance**
- **Program Office schedule analysis results are provided to and iterated with Project Management and individual project scheduling personnel**



Program Office: *Earned Value Management*

- Program Office receives Earned Value Management (EVM) information, as it is available, from individual projects during Phases B, C & D
- Program Office uses the EVM data and resultant analysis at various levels of the WBS to monitor project progress and foretell potential problem areas. Specifically,
 - Cost Performance Index (CPI)
 - Schedule Performance Index (SPI)
- Integrated Baseline Review (IBR)
 - Program Office participates in IBRs conducted by implementing organizations
 - Program Office conducts IBR on the project



Program Office: *Miscellaneous*

- **The Program Level Requirements Appendix (PLRA) of the Planetary Missions Program Plan is developed at the start of Phase B and updated after the Confirmation Review (post PDR and KDP-C)...start thinking about it in Phase A**
- **The Project must develop a Cost Analysis Data Requirement (CADRe) spreadsheet prior to PDR to support the Confirmation Process**
- **Think hard about number of test beds needed (consider fault protection/autonomy testing)**
- **Watch for optimistic workforce roll off estimates for launch**
 - **Optimistic Test Schedules**
 - **Verification and Validation**
 - **Planned Phase D work rolled into Phase E**



Web Resources

More information for Planetary Missions Program

- <https://planetarymissions.nasa.gov>



www.nasa.gov