

National Aeronautics and Space Administration

**NASA Program Management Improvement and Accountability
Act (PMIAA) Implementation Plan (Full Draft)**

November 30, 2018

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Preface

This document provides the National Aeronautics and Space Administration's (NASA's) Full Draft Plan to implement the provisions of the Program Management Improvement and Accountability Act (PMIAA) Public Law 114-264-Dec 14, 2016 in accordance with the Office of Management and Budget (OMB) guidance in M-18-19¹ dated June 25, 2018. Consistent with the principles outlined in the OMB guidance, this plan incorporates efforts and strategies designed to enhance the already strong Program and Project Management (P/PM) capabilities of NASA.

The document is organized in two parts. Part I addresses each element of the OMB guidance, Appendix 6, Agency PMIAA Implementation Plan and provides a detailed description of the capabilities already available at NASA along with commentary concerning areas that could be further strengthened. Part II discusses the efforts that NASA is already or will be pursuing to further strengthen its P/PM capabilities and includes the plan and milestone schedule for their implementation.

¹ Improving the Management of Federal Programs and Projects through Implementing the Program Management Improvement Accountability Act (PMIAA)

1. NASA PMIAA Implementation Plan Part I

Part I of the NASA PMIAA Implementation Plan addresses each of the elements of Appendix 6 of the OMB guidance.

1.1 NASA Program Management Improvement Officer (PMIO) and Relationship to NASA Organization and Governance Structure

The NASA Program Management Improvement Officer (PMIO) is James Ortiz, PhD (see Appendix A for Dr. Ortiz’ resume.) The PMIO organizational relationships are illustrated in Figure 1.

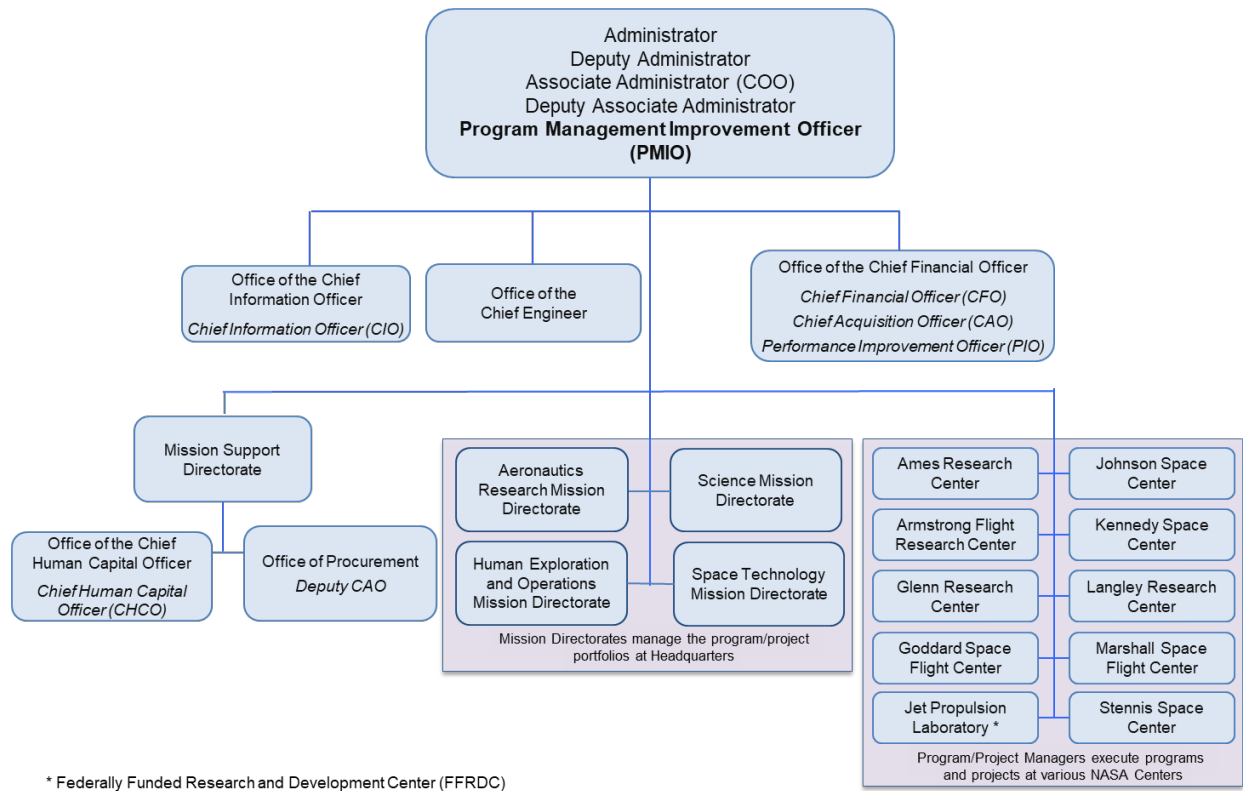


Figure 1. NASA PMIO Organizational Relationships

The PMIO works directly for the NASA Associate Administrator (AA), who is the NASA Chief Operating Officer (COO), and interfaces with the:

- Chief ‘X’ Officers (Chief Information Officer (CIO), Chief Financial Officer (CFO), Chief Human Capital Officer (CHCO), and Chief Acquisition Officer (CAO));
- Mission Directorates that manage the program portfolios;
- Program and project managers who execute programs and projects at the NASA Centers; and

- Chief Engineer, who is responsible for NASA P/PM policy, procedural requirements, and implementation guidance.

The role of the PMIO at NASA is under development with a key emphasis on providing a focal point for integrating P/PM capabilities across the Agency in support of the NASA AA/COO and consistent with the PMIAA PMIO duties.

NASA has established a PMIAA Team led by the PMIO. Team members include representatives from the CXO offices, the Mission Directorates, and the Office of the Chief Engineer (OCE). The team serves as the NASA coordination forum for planning and guiding Agency implementation of the PMIAA.

NASA uses the senior leadership councils depicted in Figure 2 to govern the Agency. Each council is briefly described in the paragraphs following the figure, and details are available in NASA Policy Directive (NPD) 1000.3E, The NASA Organization (https://nodis3.gsfc.nasa.gov/npg_img/N_PD_1000_003E_/N_PD_1000_003E_.pdf).

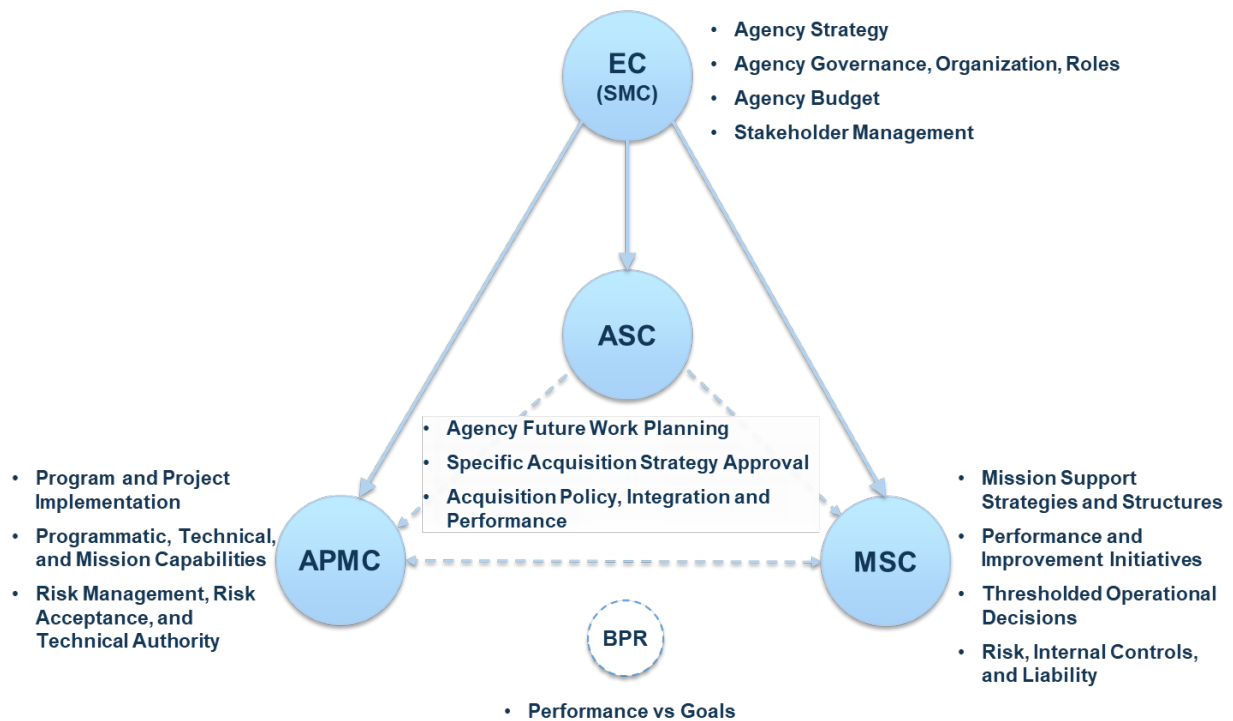


Figure 2. NASA Governance Structure

The **Executive Council (EC)** determines NASA’s strategic direction, assesses Agency progress toward achieving the NASA Vision, and serves as the Agency’s senior decision-making body for Agency-wide decisions. The NASA Administrator is the EC Chair.

In addition to the governing councils, the Administrator may convene NASA senior leadership to provide advice on key issues and strategy through the **Senior Management Council (SMC)**. The NASA Administrator is the SMC Chair.

The **Acquisition Strategy Council (ASC)**² serves as the Agency’s senior decision-making body regarding future work planning, specific acquisition strategy approval, and acquisition policy integration and performance. The NASA AA/COO is the ASC Chair.

The **Agency Program Management Council (APMC)** serves as the Agency’s senior decision-making body regarding the integrated Agency mission portfolio. The APMC also monitors the health of the program management and technical capabilities needed to execute NASA's mission. The NASA AA/COO is the APMC Chair.

The **Mission Support Council (MSC)** serves as the Agency’s senior decision-making body regarding the integrated Agency mission support portfolio, and mission support plans and implementation strategies (including facility, infrastructure, and workforce and associated investments). The NASA Deputy AA is the MSC Chair.

While not a council, the **Baseline Performance Review (BPR)** is closely linked with the councils and integral to council operations. The BPR is an internal assessment and reporting forum that tracks program and project performance monthly against Agency plans. The NASA AA/COO is the BPR Chair.

The NASA AA/COO chairs the senior leadership councils and reviews related to program and project management including the APMC and the ASC, as well as the BPR. The PMIO attends these particular forums and reviews for PMIAA-related topics.

1.2 NASA Major Acquisition Program Portfolios and Strategic Review Plan

1.2.1 NASA Portfolios

For the purposes of PMIAA implementation, NASA’s major acquisition portfolios will be broadly defined using the organizational structure authorized by NPD 1000.3E. This includes the following four Mission Directorates:

- Aeronautics Research
- Human Exploration and Operations
- Science
- Space Technology

Each Mission Directorate is led by a Mission Directorate Associate Administrator (MDAA) who reports directly to the NASA Associate Administrator. MDAAAs are responsible for

² The EC officially established the ASC in October, 2018. Part II, Section 2.2 provides additional detail on the ASC’s background, status, and plans.

- managing the Mission Directorate's program portfolio with accountability for the safety, success, and performance of the programs and projects assigned to them;
- defining and overseeing the implementation of NASA programs and projects to ensure their outcomes meet schedule and cost constraints as well as performance requirements;
- providing guidance regarding future capability needs required to accomplish the Agency's mission as well as supporting the necessary resources to meet the specific goals and objectives of the Mission Directorate;
- providing strategic guidance and input to the NASA Strategic Plan while establishing and maintaining the Mission Directorate's strategy and corresponding portfolio to meet Agency goals and objectives;
- providing guidance to the strategic acquisition process, which includes making decisions regarding acquisition strategy as delegated and overseeing the implementation of decisions from that process; and
- executing programmatic authority³ in managing programs and projects within their Mission Directorate.

The NASA AA/COO reviews a subset of these portfolios annually as part of the existing Strategic Review process (see Section 1.2.2).

For the purposes of PMIAA compliance activities, portfolio programs and projects under consideration include all non-Information Technology (IT) major programs and projects with a life-cycle cost equal to or exceeding \$250 million. This threshold is consistent with all Agency major program management and reporting requirements. It is also consistent with the definitions used by the Government Accountability Office (GAO) during its ongoing programmatic assessments of the Agency, which include its biennial High Risk report. As such, this threshold will ensure that all identified GAO High Risk areas are considered within the Agency's annual portfolio review in accordance with PMIAA requirements.

1.2.2 Integrating Portfolio-level Reviews into the Current Annual Strategic Review Framework

NASA conducts an annual assessment of progress against the strategic objectives identified in the 2018 Strategic Plan (NPD 1001.0C). This "Strategic Review" is mandated within the [Government Performance Results Act Modernization Act of 2010 \(GPRAMA\)](#) with specific requirements for each exercise codified in annual updates to OMB Circular A-11, Part 6, as well as additional requirements communicated through the standalone Strategic Review Guidance memorandum M-18-15.

³ Consistent with NPD 1000.0, NASA's Programmatic Authority includes the Mission Directorates and their respective programs and projects. Programmatic Authority sets, oversees, and ensures conformance to applicable programmatic requirements including cost, schedule and technical content.

In accordance with GPRAMA, the Strategic Review is conducted under the authority of the NASA AA/COO and managed by the PIO (currently the Office of the Chief Financial Officer (OCFO) Strategic Investments Division (SID) Director). The Strategic Planning, Performance Management, and Reporting Branch within OCFO SID is responsible for the coordination of the review, and the BPR is utilized as the forum for the Agency meeting that concludes the internal portion of the review. The annual Strategic Review cycle officially concludes with a Principals Meeting held at OMB where the results of the internal review are discussed with representatives of the Administration.

Tactically, the Strategic Review begins with each NASA organization developing an assessment of their ongoing and planned activities in support of each strategic objective assigned to their organization. In addition, the OCFO SID independently assesses Agency progress and commitments in support of each strategic objective. The results of both assessments are presented to the NASA AA/COO, who in turn determines a final “rating” for each strategic objective. The ratings, along with a high-level summary of the considerations for each rating, are provided to OMB in a “Summary of Findings” report, which is used to develop the agenda for the Principals Meeting that concludes the review cycle. OMB provides annual guidance for ratings and specific requirements for the Summary of Findings report.

In accordance with M-18-19, NASA will begin incrementally integrating a portfolio-level review component into its existing Strategic Review framework. The Agency will utilize the upcoming 2019 review cycle as a pilot year. Following the conclusion of the pilot year, NASA will establish a permanent format for the portfolio-level review component.

During the pilot year, the 2019 Strategic Review will be modified as follows:

- One Mission Directorate portfolio will be selected to participate in the initial portfolio-level review.
- The NASA AA/COO will select the portfolio by FY19 Q2.
- The MDAA (or designee) will provide a high-level assessment of the portfolio’s strengths and weaknesses at the beginning of the annual Strategic Review meeting held at the April BPR.
- A template developed by the PMIO will be provided to the selected portfolio owner. The template will include the following considerations:
 - The performance of the non-IT major programs and projects in the portfolio (life-cycle cost greater than \$250 million);
 - Opportunities for improvement as well as the identification of any barriers to achieving program outcomes;
 - Identification of 2-3 major acquisitions that have demonstrated particular success in the last two years;
 - Identification of 2-3 major acquisitions that have encountered challenges in the last two years; and

- Any additional lines of inquiry that the PMIO decides are necessary.
- The NASA AA/COO will provide feedback/guidance to the selected portfolio manager (MDAA) as necessary. Corrective actions and/or follow-on investigations may be assigned during the Strategic Review meeting.
- A high-level synopsis of the portfolio review, including any assigned corrective actions and investigations, will be included in the Summary of Findings report provided to OMB (expected May 21, 2019).
- An agenda item will be added to the Principals Meeting at the conclusion of the 2019 review cycle (expected no later than June 28, 2019) to ensure a dialogue between OMB and the Agency regarding the selected portfolio's successes and/or challenges.

Figure 3 shows the schedule for the integrated Strategic/Portfolio Review for the 2019 pilot year.

Key Milestones	FY2019					
	January	February	March	April	May	June
Pre-Brief with COO (NLT) (selection for Pilot Portfolio Review)	1/11 △					
Strategic Review Kickoff (NLT)		1/31 △				
Enterprise Risk Management Coordination		1/31 △	—————			5/21 △
Independent Strategic Review Assessments (OCFO Strategic Investments Division)		1/31 △	3/4 △			
Strategic Objective Owners Self Assessments		1/31 △	3/4 △			
Portfolio Owner Self Assessment		1/31 △	3/4 △			
Reconciliation Discussions (where necessary)			3/4 △	4/4 △		
PIO Decisional Briefing (NLT)				4/11 △		
NASA Strategic Review with COO (Baseline Performance Review)				4/25 △		
Deliver Summary of Findings to OMB					5/21 △	
OMB/NASA Strategic Review Meeting (NLT) (to include Portfolio Review discussion)						6/28 △

Figure 3. Integrated Strategic / Portfolio Review Schedule (Pilot Year)

The PMIO will oversee the portfolio-level review component of the 2019 Strategic Review, which will address adherence to generally applicable program management principles, practices, and standards associated with successful program outcomes in addition to specific standards based on the type of program being reviewed. Agency managers will be held accountable for addressing needed improvements identified during the portfolio-level component of the review.

In accordance with GPRAMA, the PIO (OCFO SID Director) conducts the Strategic Review and will retain responsibility for all other components and activities associated with the 2019 Strategic Review.

NASA and OMB will evaluate the results of the 2019 portfolio-level review prior to initiating the 2020 Strategic Review. The results of that evaluation along with any additional guidance communicated in future iterations of OMB Circular A-11, Part 6 will be used to enhance the portfolio-level review process starting in 2020. The GAO's 2019 High Risk Report (expected February 2019) may introduce additional considerations. Any adjustments to the portfolio-level review process will be codified in future updates to the Agency's five-year implementation plan for PMIAA. Areas for inclusion in future reviews include major IT investments and, potentially, grants.

1.3 P/PM Training, Recruitment Enhancements, and Career Path Opportunities for Program and Project Managers

NASA's current P/PM training opportunities, recruitment strategies, and career path opportunities for program and project managers are described in this section, along with planned actions for enhancing these strategies and opportunities.

1.3.1 Enhancing Training and Educational Opportunities

The NASA Academy of Program/Project and Engineering Leadership (APPEL) has a strong history of providing quality project management training across the Agency. During FY18, the Academy conducted 155 courses and trained 3,251 attendees. APPEL offers a catalog of 65 instructor-led courses along with a broad collection of project management literature, videos, and on-line resources. All APPEL P/PM courses are accredited through the Project Management Institute (PMI) as well as the International Association for Continuing Education and Training (IACET).

APPEL has received several prestigious awards including the "Best Academy in the World" award from Human Systems International (owned by PMI). APPEL has also received the "IACET Exemplar Award" recognizing the Academy for "... an exemplary, results-oriented training program that demonstrates a cost-effective, significant, and relevant impact on their organization." NASA's first place finish in training throughout the entire federal government is evidence of APPEL's success

(http://bestplacestowork.org/BPTW/rankings/categories/large/trainingdevelopment_17).

It is important to note that APPEL continually receives NASA upper management support along with sufficient funding to accomplish its mission.

To periodically enhance and update its P/PM curriculum, APPEL employs a continuous improvement process. All courses go through a review process conducted every 3-5 years that includes NASA subject matter experts to ensure relevancy, currency, and policy integration. APPEL team members travel to a variety of courses each year to monitor class engagement and instructor effectiveness, and to meet with attendees for first-hand feedback. APPEL also provides an on-line evaluation system that attendees use to provide feedback.

Outside of the review and feedback processes, the APPEL P/PM curriculum is updated as needed to respond to significant changes in P/PM policies or practices, incorporate lessons learned, and adjust to significant changes in the P/PM environment, such as more diverse acquisition approaches and the use of alternative life cycles.

Current APPEL training update opportunities include

- incorporating the variety of approaches the Agency now uses in developing its flight projects (such as partnerships with industry);
- incorporating up-to-date information on alternative life cycles (such as agile development life cycles);
- adapting the curriculum to better address the needs of NASA IT project managers; and
- updating training materials as needed to match the improvement efforts mentioned in Part II of this document.

Training opportunities to enhance workforce skills and expertise outside of APPEL are also planned. For example, NASA OCFO has initiated the development of a Project Planning and Control (PP&C) Training Curriculum to help bridge the gap between the current-state workforce and the desired future-state workforce of highly trained analysts. Establishing a training curriculum where courses reflect the Agency's best practices and methods is necessary to grow and strengthen the Agency's PP&C capabilities.

A PP&C Career Development and Progression Framework will be established to provide training and guidance to the PP&C workforce. This framework will offer a roadmap on how to enhance or develop PP&C skills. It will include tiered competency matrices of entry-level to advanced-level PP&C analysts that are reinforced with a common, centralized PP&C training curriculum. This curriculum will increase the Agency's programmatic proficiency level, encourage adherence to Agency best practices and processes, promote the consistent application of analytical methods and techniques, and produce more coherent, reliable work products.

1.3.2 Improving Recruitment and Retention

NASA has a very low overall Agency attrition rate (4.8% in FY17), which is half of the federal rate and less than a third of the industry rate. NASA's highly valued missions and its appreciation of its civil servants make NASA an attractive employer for current and new employees as evidenced by positive results from the Federal Employee View Point Survey and the Best Places to Work ranking score.

Most of NASA's program and project managers are recruited from its engineering workforce. APPEL, through the OCE, provides a wealth of training and development opportunities for NASA program and project managers to build upon their engineering skills and develop critical P/PM skills and expertise. APPEL's investment in the P/PM workforce greatly contributes to NASA's ability to retain a best-in-class workforce. Exceptional training and development opportunities, along with the prestigious and challenging missions managed by NASA's program and project managers, are such that there are currently no identified issues with retention of NASA's P/PM workforce.

NASA has a focused effort underway to improve Strategic Workforce Planning as described in Part II of this document. This effort has the potential to improve strategic planning as applied to the NASA P/PM workforce and enable NASA to better respond to changes in direction or strategies in the development of our missions and to increase the diversification of our P/PM workforce through various approaches, potentially including external recruitment. The P/PM workforce represents a critical capability to enable the NASA programs and projects that implement the NASA Strategic Plan.

1.3.3 Use of Career Paths to Expand Opportunities and Abilities

APPEL provides an on-line tool to assist NASA employees in exploring possible career paths in project management (<https://appel.nasa.gov/career-resources/development-framework/>) along with an extensive competency model (<https://appel.nasa.gov/career-resources/competency-model/>) listing forty-nine separate competencies required for project managers. The tool also directs employees to a variety of courses and other resources to help develop each individual competency.

As the U.S. Office of Personnel Management (OPM) completes its work under PMIAA on the federal P/PM career path, NASA will review and update the APPEL career path as needed. In parallel, the Agency will take a fresh look at the NASA career path based on its current direction and workforce. One area of emphasis is supporting the on-going efforts of the Office of the Chief Information Officer (OCIO) to develop a career path and certification for IT program and project managers.

1.3.4 NASA Mentorship Programs

NASA has a long and successful history of mentorship within, across, and beyond the P/PM domain. A foundation of NASA's mentoring culture resides in the day to day, hands-on job experience provided by its programs and projects. NASA continuously strives to partner emerging leaders/journeyman employees with its more senior-level program and project managers. This provides tremendous support and learning for employees while contributing to NASA's mission.

More formally, NASA's Mentoring Program is designed to support knowledge transfer and growth at the local level. Center mentoring programs vary from informal to very formal with specific start/end dates, requests to employees for participation, assignment of mentors, etc. Collectively, NASA makes significant investments in mentoring and provides flexibility at the Center level to design programs that best meet the mission needs of the local workforce.

NASA also facilitates mentoring at the Agency level through Agency leadership development programs such as NASA FIRST (Foundations of Influence, Relationships, Success, and Teamwork), NASA LASER (Leveraging Agency Supervisory Excellence and Resilience), NASA SELDP (System Engineering Leadership Development Program), NASA MLLP (Mid-Level Leadership Program), and NASA SES CDP (Senior Executive Service Career Development Program). These programs all include guides, leaders, sponsors, or mentors who have mentoring functions and responsibilities. Program participants include program and project managers. Periodically, NASA provides Agency-wide, focused mentoring activities in support of

cross-agency mission needs. Agency mentoring programs are focused on broad career and workforce development needs.

NASA plans to examine its current mentoring infrastructure and evaluate a more focused mentorship effort for the P/PM workforce in concert with the initiative under the President's Management Agenda (PMA) Cross-Agency Priority Goal 11.

1.4 Collection and Dissemination of Agency Policies, Best Practices, Lessons Learned, and Tools

NASA uses numerous and diverse methodologies to collect and disseminate Agency policies, best practices, and lessons learned, ranging from extensive online libraries to Webcasts to symposiums. Several of the key methodologies are described in this section.

NASA publishes Agency policies in the NASA Online Directives Information System (NODIS) library at <http://nodis3.gsfc.nasa.gov/>. Responsible offices develop, coordinate, and promulgate NASA directives in accordance with NODIS requirements, and documents are published through the NODIS process in accordance with NASA Procedural Requirements (NPR) 1400.1, NASA Directives and Charters Procedural Requirements. A NASA directive is a document that formally prescribes requirements derived from law, the President, federal regulation, the NASA Administrator, or other senior NASA officials. Directives include NASA or Center policy directives (NPDs, Center Policy Directives (CPDs)) that state the Agency's or Center's policies and NASA or Center procedural requirements (NPRs, Center Procedural Requirements (CPRs)) that provide detailed procedural requirements to implement the Agency or Center policies. The Administrator approves all NPDs and NPRs, and Center Directors approve all CPDs and CPRs.

NASA also uses the NASA Technical Reports Server (NTRS) library for technical publications, conference papers, special reports, and handbooks, many of which capture best practices or provide guidance for implementation of NASA directives (<https://ntrs.nasa.gov/search.jsp>). Handbooks also contain templates, examples, and references to P/PM tools. Handbook examples include the NASA Space Flight Program and Project Management Handbook, the Project Planning and Control Handbook, and the Standing Review Board Handbook. In addition, some NASA handbooks, such as the Cost Estimating Handbook (<https://www.nasa.gov/offices/ocfo/nasa-cost-estimating-handbook-ceh>), are located on the Web sites of NASA organizations.

In addition, NASA uses internally developed, Agency-specific standards as well as voluntary consensus standards developed by external consensus standards bodies, consistent with OMB Circular No. A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities. These are accessible through the NASA Technical Standards Program Web site at <https://standards.nasa.gov/>.

NASA has a robust system in place for cataloguing and disseminating lessons learned. The Lessons Learned Information System (LLIS) has over 2,000 individual lessons learned documented in the database and averages over a thousand views per month. APPEL Knowledge Services provides easy access to all available Agency lessons learned repositories directly from its Web page (<https://appel.nasa.gov/lessons-learned/>).

NASA also has several Communities of Practice (CoP) including the NASA Engineering Network Project Management CoP (<https://nen.nasa.gov/web/pm>), the Earned Value Management (EVM) CoP, and the Cost and Schedule CoP. The purpose of these communities is to provide a collaboration forum for program and project managers and teams across NASA to exchange information, knowledge, best practices, experience, lessons learned, and ideas.

The NASA Virtual Project Management Challenge (VPMC) is an inspiring and informative Agency training event designed to examine current trends in P/PM. The goal is to expose NASA practitioners to diverse perspectives, providing a forum for knowledge sharing and exchange of lessons learned. By attracting stakeholders from all experience levels of the NASA workforce, the VPMC establishes an important link between NASA world-class experts and its emerging leaders of tomorrow. The VPMC uses Webcasting to broadcast live presentations and discussions to participants. Each Webcast is called a session. Each session is live and interactive, with the opportunity for the audience to pose questions to the speaker through a session moderator. Up to nine sessions are broadcast annually. Sessions are recorded and made available on a Web site for on-demand viewing approximately two weeks following the event. Refer to the NASA VPMC Web site for further information:

<http://www.nasa.gov/offices/oc/pmchallenge/index.html>.

The annual NASA Cost and Schedule Symposium provides NASA cost and schedule communities the chance to exchange ideas, best practices, methodologies, and lessons learned. Recognizing the community's efforts and affording the community an opportunity to present in a professional forum fosters individual and community growth and improves the overall analysis community at NASA. Attendees and presenters are substantively involved in the conference by submitting professional papers, conducting briefings and presentations, completing live demonstrations, and participating in training. Refer to the NASA Cost and Schedule Symposium Web site for additional information:

https://www.nasa.gov/offices/ocfo/cost_symposium.

1.5 Plan for Assessing Current P/PM Staffing, Skills, and Competences

NASA workforce planning begins with Agency strategic implementation planning that includes the determination of NASA's capacity and acquisition strategy aligned with the NASA Strategic Plan and the Center roles. Mission Directorate program portfolios are aligned with the Agency strategic acquisition planning. The field Centers assess the program mission demands and develop detailed workforce plans to implement the programs assigned to their Center.

Each Center

- assesses P/PM staffing skills and competencies and aligns them with NASA's workforce planning;
- determines the needs for P/PM training and development opportunities to support the skill sets required to implement the programs assigned to their Center; and
- uses approaches such as career path assessment tools, formal training, on the job training, and mentoring to plan for the development of the P/PM workforce resident at their Center. (These approaches may be implemented at different levels of standardization and maturity from Center to Center.)

As part of PMIAA, NASA will assess opportunities for synergies, incorporation of best practices, and standardization across the NASA field Centers.

2. NASA PMIAA Implementation Plan Part II

Part II of the NASA PMIAA Implementation Plan describes the efforts NASA is already making or will be pursuing to further strengthen its P/PM capabilities.

As described in Part I of this plan, NASA has a very strong program management capability across the different elements being considered as part of PMIAA. The Agency continuously improves its program management capabilities as program management is essential to achieving NASA's mission. The main efforts the Agency is undertaking to further improve its program management capabilities consistent with PMIAA and with PMA Cross-Agency Priority Goal 11 are addressed below.

2.1 Renew the NASA Corrective Action Plan (CAP) for GAO High Risk

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 vulnerability to fraud, waste, abuse, and mismanagement, or that are in most need of transformation. GAO designated NASA's acquisition management as high risk in 1990 in view of the Agency's history of cost growth and schedule delays in major flight projects.

The previous version of the NASA Corrective Action Plan (CAP) was established in 2007 with an update in early 2008. The plan encompassed NASA's policies and processes concerning P/PM and the associated surveillance of contractors through appropriate insight and oversight. Initiatives in the 2007 CAP plan included the following:

- Implement a State of the Agency process, later renamed BPR, for independent evaluators (i.e., OCE, the Office of Safety and Mission Assurance (OSMA), and OCFO/SID) to assess technical, cost, schedule, and programmatic performance and to enable early internal awareness of potential cost and schedule breach events.
- Update NASA policies to include key decision points, required independent reviews, identified entry and success criteria, Standing Review Board (SRB) input to a Project Management Council (PMC) after each review, and required independent cost estimates.
- Introduce a new senior-level leadership forum to ensure better integration of acquisition, strategic planning and budgeting processes – the ASC.
- Enhance APPEL curriculum with additional emphasis on project planning, scheduling, EVM, and performance analysis through experienced-based training courses.
- Ensure that Mission Directorates plan and budget certain programs and all major projects based on a 70% joint cost and schedule confidence level.
- Store completed Cost Analysis Data Requirement (CADRe) documents in a Web-based repository for community use.
- Enhance quarterly and annual cost and schedule performance reporting processes to external stakeholders.

The initiatives in the 2007 CAP plan have been completed, are fully operational, and are embedded in how NASA does business.

GAO recognizes that NASA has made progress in the five years between 2012 and 2017, but that NASA still faces significant challenges in some of its current flight projects. These challenges indicate a need to improve

- the completeness and reliability of NASA's cost and schedule estimating;
- the estimation of risks associated with the development of major systems; and
- the management of aggressive schedules.

In order to further address persistent challenges with cost and schedule in major projects and to build upon the work completed in the 2007 CAP, the Agency has undertaken an update to the GAO High Risk CAP. A summary of the main areas of focus with examples of the initiatives under consideration include

- Program Planning and Control (e.g., establish PP&C training curriculum; enhance and emphasize EVM);
- Cost and Schedule Estimating & Performance Monitoring (e.g., develop schedule repositories; assess implementation indicators for trends and projections; assess enhancements to probabilistic programmatic policy)

The CAP update is being developed by a NASA working group with representatives from major stakeholder organizations and is being overseen by a steering committee from senior agency leadership. The update began in early September 2018 and is proceeding on schedule for Agency review and approval by the APMC in December 2018. The final plan will include specific initiatives chosen for further assessment or implementation beginning in 2019. The agency will address any changes and updates to incorporate the results of these improvements into our policies, procedures, and training as applicable.

2.2 Improve Agency Governance by Establishing the Acquisition Strategy Council (ASC)

NASA adopted a formal Acquisition Policy, NPD 1000.5, in 2009. Since then a variety of governance and non-governance meetings have implemented dimensions of acquisition policy. In April 2018, the Acting Administrator proposed consolidating a number of existing governance and non-governance meetings supporting implementation of the NASA acquisition policy under one Decision Authority in a new formal governance council. A full proposal for this new governance council was developed for consideration by the new Administrator, and the EC approved the creation of the ASC on October 16, 2018.

Improvements addressed by the ASC include

- clearer differentiation and decision authority regarding contract and partnership strategies;
- consolidation and integration of key decisional meetings into a single council; and
- more effective integration of results from strategic work planning meetings into acquisition strategy decisions.

The ASC also provides a forum for discussion of strategic management of NASA's supplier and partner base.

The anticipated benefits of the ASC are

- better documentation and communication of acquisition decisions;
- stronger compliance with acquisition policy;
- strengthened link between strategy and execution;
- a forum to address strategic contractor/partner management; and
- a forum to develop criteria for make/buy, lead/partner, high/low risk.

ASC implementation plans for 2019 include

- finalizing the ASC charter;
- formally incorporating the ASC into Agency policies and procedures;
- determining whether current delegations of specific partnership authorities should be retained or reassigned; and
- revising Partnership CoP documentation and guidance (e.g., Partnerships Guide) to reflect ASC decision authority.

2.3 Strategic Workforce Planning

The current workforce management process of the Agency is complex with responsibility for workforce planning performed in a decentralized fashion between organizations that control the demand for workforce (i.e., Mission Directorates with control of program and project portfolios) and those organizations that control the supply of the workforce (i.e., Centers responsible for staffing programs and projects). Workforce planning is currently integrated primarily as part of the budget processes. For the above reasons, current workforce planning tends to be work-intensive; has a tactical focus; and lacks flexibility and adaptability to shape the Agency's workforce in response to changes in acquisition strategies, direction, or the external environment.

To address improvements in workforce planning, NASA chartered a Strategic Workforce Planning Team. The objectives of the team include

- developing an Agency Strategic Workforce Process that has clear decision-making authorities and process ownership;
- assessing enhanced hiring flexibilities in coordination with OPM;
- creating an Agency Workforce Master Plan; and
- providing recommendations for how the Agency can reshape the workforce.

The resulting strategic workforce planning process is expected to enable an increased ability to simplify the planning processes and to further increase sharing of workforce resources across the Agency. Agency approval of the Strategic Workforce Planning Team's recommendations is

expected in FY19. Implementation of the recommendations is expected to begin with a pilot phase followed by gradual implementation. NASA will ensure synergy between the workforce planning improvements resulting from this effort and the P/PM talent management strategies under PMIAA.

2.4 Other Improvement Efforts Related to P/PM Talent Management

NASA plans to undertake improvements to the areas mentioned under Part I. These include addressing enhancements needed in our training to better address more diverse acquisition approaches (e.g. partnering with industry) and alternative lifecycles (such as agile development lifecycles). In addition, as OCIO formalizes a certification approach for IT PMs, the training curriculum will be reviewed to ensure it provides appropriate content.

Although NASA has developed a career path to support the needs of the NASA mission, it is open to revisiting its approach after seeing the results of the OPM efforts to develop a career path for the Federal PM community. The Agency mentoring programs are focused on broad career development and workforce development needs. Opportunities for mentorship both within projects, local mentoring programs, and through the APPEL curriculum currently meet the needs of the NASA workforce. However, NASA will evaluate the need for a specific project management Mentoring Program consistent with PMA Cross-Agency Priority Goal 11.

Part I mentioned that P/PM workforce development processes used across NASA's Centers vary in maturity and are being implemented at different levels of standardization. NASA will assess opportunities for synergies, incorporation of best practices, and standardization across its Centers as part of PMIAA.

2.5 Ongoing Support of Efforts Related to PMIAA

NASA will also continue supporting the following PMIAA-related efforts with OMB, OPM, and other agencies as planned and coordinated by the Program Management Policy Council (PMPC):

- Portfolio Reviews starting in FY19 consistent with the approach described in this plan;
- Participation in OPM-led efforts supporting Strategy 3 (P/PM Talent Management) related to competency models, classification, qualification, and career paths including incorporating results into the Agency P/PM talent management approaches and infrastructure as appropriate;
- Assessment of recommended P/PM standards and practices; and
- PMIO engagement with PMPC activities including sharing of best practices.

2.6 Schedule

Table 1 provides the schedule of key activities in the NASA PMIAA Implementation Plan. The schedule shows the phased approach for implementation consistent with the three phases of the PMIAA implementation in M-18-19.

Table 1. Schedule of Key Activities in the NASA PMIAA Implementation Plan

Phase I (FY18 Q3 – FY19 Q4)
GAO High Risk Corrective Action Plan (CAP) baselined. Begin implementation (by FY19 Q 1)
Acquisition Strategy Council (ASC) - Finalize formal charter; incorporate into Agency documentation; review previous delegations and begin operations (by FY19 Q2)
Strategic Workforce Planning- Baseline plan approved by the Agency (FY19)
Complete NASA assessment against PMIAA recommended principle-based standards (FY19 Q3)
Complete further definition of PMIO role in P/PM capability integration (by FY19 Q2)
Conduct first PMIAA portfolio-level review as part of the Strategic Review (by FY19 Q3)
Support OPM P/PM Talent Management surveys and focus groups.
Review NASA training curriculum for updates (new acquisition approaches; diverse life cycles; training to support IT PM) (by FY19 Q4)
Assess options to incorporate P/PM focus into current mentoring programs (by FY19 Q4)
Phase II (FY20 Q1 – FY21 Q4)
GAO High Risk Corrective Action Plan (CAP) initiatives underway and status per Agency Plan (by FY21 Q4)
Acquisition Strategy Council (ASC) in operations. Incorporate improvements from initial operation as necessary (by FY21 Q4)
Initial implementation of Strategic Workforce Planning including P/PM (by FY20 Q4)
Complete NASA assessment against PMIAA revised recommended principle based standards (FY21 Q4)
Incorporate NASA training improvements/changes from CAP initiatives (by FY20 Q3)
Conduct 2nd and 3 rd PMIAA portfolio-level review as part of the Strategic Review with expanded portfolio (FY20 Q3; and FY21 Q3)
Review OPM P/PM Talent Management results and incorporate into Agency career path; classification as required (by FY21 Q4)
Assess processes for planning and development of the P/PM workforce for incorporation of best practices and standardization (by FY20 Q4)
Phase III (FY22 focus)
Revised 5-year PMIAA Implementation Plan

Appendix A - Resume for James Ortiz, PhD

James Ortiz is a Senior Advisor to the NASA Associate Administrator. As part of that role, he leads Agency transformation activities on behalf of the Associate and Deputy Associate Administrator in aspects of Program Management and Engineering Capabilities. He has been named as the NASA Program Management Improvement Officer (PMIO) to lead NASA's implementation of the Program Management Improvement and Accountability Act (PMIAA).

Dr. Ortiz was the former Director of the Independent Program Assessment Office (IPAO) from 2009 to 2015 at NASA Headquarters. As Director of the IPAO, he had responsibility over the independent assessment of the Agency's highest priority spaceflight projects including assessing for sound technical approaches, adequate cost, schedule, management, and overall risk posture to ensure that spaceflight projects were on a path to mission success.

Dr. Ortiz joined NASA at the Johnson Space Center (JSC) in July 1990 from the U.S. Air Force where he served as flight test engineer for electronic warfare systems on high performance aircraft. During his career at NASA, Dr. Ortiz has held several technical and executive assignments including Head for International Space Station Astronaut and Flight Controller Systems Training; Senior NASA Research Exchange Engineer with the Air Force Research Laboratory in New Mexico; Chief of the JSC Mission Operations Advanced Projects Office; and Manager of the Office of Analysis and Assessment reporting to the JSC Center Director. He later served as Deputy Manager for Integrated Avionics and Software for the next human space exploration vehicle, the Orion project. Dr. Ortiz also led the design certification review of the Space Shuttle fleet for return to flight after the Columbia accident.

Dr. Ortiz holds a PhD in Electrical Engineering (EE) from the University of Houston, a ME in EE from the University of Florida, and a MS in Systems Engineering from the Naval Postgraduate School in Monterey, CA. He holds a BS in EE from Los Andes University in Colombia, South America. Dr. Ortiz is a graduate of the Senior Manager's in Government Program at the Kennedy School at Harvard University.

Dr. Ortiz is a member of the U.S. Government Senior Executive Service.