National Aeronautics and Space Administration



NASA's FY 2014 Management and Performance

Including the FY 2012 Agency Performance Report

And the

FY 2013 Performance Plan Update FY 2014 Performance Plan

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INTRODUCTION

The Management and Performance section of NASA's Congressional Justification describes the Agency's approach to performance management. The complete section is available on http://www.nasa.gov/news/budget/index.html, and provides a comprehensive record of past and planned performance for Agency programs and projects, from 2007 to 2014. The Management and Performance section:

- Describes NASA's performance management cycle and its underlying processes and tools;
- Presents the Agency's FY 2012 performance in the Annual Performance Report;
- Updates commitments set last year in the FY 2013 Performance Plan;
- Sets performance targets in the FY 2014 Performance Plan aligned with this Congressional Justification budget request;
- Presents program performance against cost and schedule estimates in the Major Program Annual Report; and
- Discusses the results of performance evaluations and subsequent improvement actions.

NASA's Approach to Performance Management

"NASA's Approach to Performance Management" shows that activities follow a cycle that allows for feedback among three phases: Plan, Evaluate, and Report. This cycle integrates processes and tools to:

- **Plan** and implement strategy and performance;
- Monitor and evaluate performance toward commitments;
- Report decision-making information to NASA leaders and other stakeholders; and
- Inform future planning.

The Agency's performance management cycle begins with the planning phase. NASA leaders employ two distinct planning processes for setting long- and short-term priorities. NASA's management councils first set the strategic plan, which lays out the Agency's long-term priorities and commitments, and its strategy and performance. The framework aligns the implementation activities of programs and projects with the Agency's strategic direction. Next, NASA builds its annual performance plan upon the strategy and performance framework. Annual performance plans contain the tactical, short-term steps necessary along the path to each strategic goal.

Evaluation is the second phase of the performance management cycle. The Agency continually monitors progress against targets as programs and projects execute the performance plan. NASA leverages an internal performance assessment process to collect objective evidence of Agency performance. NASA relies on a suite of data collection and analytics tools to support these performance management activities. Specifically, in 2012, NASA launched an Agency-level system, called Performance Warehouse, to manage data collected in compliance of the <u>Government Performance and Results Act (GPRA)</u> <u>Modernization Act of 2010 (GPRAMA)</u>. Since its implementation, the system has streamlined collection, improved quality, and increased accessibility of NASA performance data.

Reporting results to decision-makers and stakeholders is the third phase of NASA's performance management cycle. NASA leverages a quarterly reporting process with other on-going assessments to drive performance information to decision-makers. NASA's recent efforts are focused on maximizing the

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outcomes of the quarterly reporting process by using the Performance Warehouse, because it increases the Agency's capacity for using evidence and evaluation in decision-making. NASA leaders and stakeholders make key investment, policy, and performance decisions based on insights from objective performance evidence and robust evaluations. These decisions drive leaders to renew, adjust, or reset strategic and performance plans.

Performance Reporting and Planning

In "Performance Reporting and Planning," NASA presents the combined FY 2012 Annual Performance Report and FY 2013 and 2014 Performance Plans. When past performance and future plans are integrated in one report, they reveal performance trends across NASA's investment portfolio. Agency leaders use this comprehensive view of performance information to plan future performance targets and strategy.

The combined performance report and plans demonstrate:

- Adherence to Agency-wide performance management processes, as described in "NASA's Approach to Performance Management";
- Six years of historical performance information and two years of future commitments on the path to each strategic goal;
- Adjustments to FY 2012 and FY 2013 performance plans to align with budget and congressional and/or the President's and strategic direction;
- Achievements toward Priority Goals¹ and Cross Agency Priority Goals; and
- NASA's commitment to transparency and accountability.

Addressing Management Challenges and Improving Performance

Comprehensive evaluations enable meaningful performance reports and inform planning activities. "Addressing Management Challenges and Improving Performance" provides an assessment of NASA's performance, with a focus on performance shortfalls and the effectiveness of corrective actions. It presents the results of continuous performance evaluation, as well as results from performance improvement efforts. NASA's evaluations:

- Rely on performance evidence from NASA Performance Warehouse and other internal performance management tools;
- Reflect assessment from stakeholders and independent assessors;
- Identify persistent issues affecting performance; and
- Inform actions to improve performance.

¹ When originally published, these goals were designated as High Priority Performance Goals. The GPRA Modernization Act of 2010 and subsequent guidance from OMB changed the designation to Agency Priority Goals. NASA is using "Priority Goals" to refer to both the original High Priority Performance Goals set in 2011 and the Agency Priority Goals set later.

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In 2014, NASA will develop a new strategic plan and supporting performance plans that will continue to reflect Agency and National priorities, as specified by Congress and the Administration. The evaluations presented in this section will inform leadership as the Agency sets its course for the next ten years, and beyond. The Agency will publish its 2014 Strategic Plan and supporting performance plans, along with historical performance plans and reports, on NASA's budget Web page at http://www.nasa.gov/news/budget/index.html.

"NASA's Approach to Performance Management" summarizes planning strategy and performance through performance evaluation and reporting. First, it provides an overview of NASA as a performancebased organization, the basis for effective performance management. It then discusses each phase of NASA's performance management cycle, and the processes and tools that support each phase. It provides context for understanding the performance reports and plans in "Performance Reporting and Planning." This section also summarizes NASA's approach to using evidence and evaluation of performance to inform investment decisions and future planning, which "Addressing Management Challenges and Improving Performance" discusses in further detail.

A Performance-Based Organization Enables Effective Management

Foundational to effective performance management is the organization and its people. A performancebased organization has a strong alignment of its strategic and performance plans with its planned investments; monitors and reports on the success of or challenges for those investments; and uses this information to set future directions. NASA is a performance-based organization that manages the work of each installation to accomplish its Vision and Mission.

VISION AND MISSION

NASA's Vision is

To reach for new heights and reveal the unknown, so that what we do and learn will benefit all humankind.

To make this Vision a reality, each day NASA pursues its Mission to

Drive advances in science, technology, and exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth.

ORGANIZATIONAL STRUCTURE

Under the leadership of the <u>Administrator</u>, NASA offices at <u>Headquarters</u> provide overall guidance and direction to the Agency. NASA's <u>Centers</u> and installations conduct the Agency's day-to-day work in laboratories, on airfields, in wind tunnels, in control rooms, and in NASA's other one-of-a-kind facilities.

NASA is organized to accomplish its mission while providing a framework of sound business, management, and safety oversight. The Office of the Administrator provides top-level strategy and direction for the Agency. The Administrator and his officers help guide programmatic direction for NASA's missions and guide the operations of the Centers.

Four organizations lead the pursuit of NASA's mission and set technical performance commitments aligned with their budgets:

- Science Mission Directorate (SMD) manages the Science budget account and focuses on programmatic work in the disciplines of Earth, planetary, astrophysics, and heliophysics research;
- Aeronautics Research Mission Directorate (ARMD) manages the Aeronautics account and applied research activities that improves the current and future state of air travel;
- Space Technology Mission Directorate (STMD), new in FY 2013, manages the Space Technology account to support the crosscutting activities of the Office of the Chief Technologist. STMD coordinates and supports advanced technology development within the Agency and the commercial sector; and
- Human Exploration and Operations Mission Directorate (HEOMD) manages the Exploration and Space Operations accounts. HEOMD manages development of the Orion Multi-Purpose Crew Vehicle (Orion-MPCV), future exploration technologies, and works with U.S. commercial space industry partners to develop commercial systems for providing crew and cargo transportation services to and from low Earth orbit. HEOMD also manages operations and research for the International Space Station (ISS), and communications systems and networks that enable deep space and near-Earth exploration.

A fifth organization aligns its performance plans and budget to support all the mission goals in a crosscutting manner. The Mission Support Directorate (MSD) manages the Cross Agency Support (CAS) and Construction and Environmental Compliance and Restoration (CECR) accounts. These accounts fund operations at Headquarters and the Centers as well as institutional and programmatic construction of facilities. MSD, through the CAS account, includes support offices that set policy and strategy for specific crosscutting Agency functions including safety and mission assurance, technology planning, education, equal opportunity, information technology, financial administration, small business administration, international relations, and legislative and intergovernmental affairs. Among other responsibilities, these offices report to the Administrator and other stakeholders on progress towards national initiatives, provide independent reviews and/or investigations, and liaise with the public and other federal agencies. While based at Headquarters, these offices typically have representatives at the Centers and provide a coordinating and control function.

Figure 1.1 shows the NASA organizational structure, current as of February 2013.



Figure 1.1: NASA's Organization

NASA employs about 18,000 civil servants who work at Headquarters in Washington, DC, the Centers, and other facilities. NASA staffs each location with a contractor workforce for technical and business operations support. Figure 1.2 shows the range of NASA's facilities.



Figure 1.2: NASA Centers and Facilities Nationwide

The Jet Propulsion Laboratory (JPL) is a Federally Funded Research and Development Center in Pasadena, California. The California Institute of Technology manages JPL.

Performance Management Cycle

NASA's performance management activities follow a cycle that ensures strategic management and accountability. Figure 1.3 shows NASA's performance management cycle.



Figure 1.3: Performance Management Cycle

In the planning phase, NASA's governing councils set the strategy, the performance framework, and the strategic plan, which consists of the Agency's long-term priorities and commitments. Then, NASA management builds its performance plan to align with the framework, ensuring that short-term priorities support the Agency's overall strategic direction.

In the evaluation phase, NASA managers monitor and measure performance of programs and projects against the fiscal year's performance plan. NASA leverages an internal performance assessment process to collect objective evidence of progress. Performance analysts verify and evaluate that evidence. When the interim data suggests a risk of performance shortfalls, the Agency requests additional information to understand and mitigate the risk.

The reporting phase connects evaluation to planning efforts. NASA managers present performance information to senior leaders, such as council members, and other stakeholders. The performance results reflect objective evidence and thorough evaluation obtained in the evaluation phase, and inform investment, policy, and performance decisions made in the planning phase of the next performance management cycle.

Strategic Management and Governance

Governance by council provides high-level oversight of the Agency-wide planning efforts that take place in planning phase of NASA's performance management cycle. NASA council members use the results of performance evaluations to shape the Agency's strategy and set its long-term priorities. NASA's governance policy ensures that leadership takes a rigorous and data-driven approach to their strategic management decisions. This disciplined governance enables efficient decision-making and planning. As shown in Figure 1.4, the governance councils affect all phases of the performance management cycle. The councils set the strategic plan and the strategy and performance framework in the planning phase. The councils drive assessment requirements of Agency performance in the evaluation phase. Finally, the councils review the results of those evaluations during the reporting phase to support decisions on new plans, and on-going implementation and operations.

NASA governs with three Agency-level councils, each with a distinct set of responsibilities. NASA Policy Directive 1000.3 includes the charters, responsibilities, and decision-making authorities of each council:

- The Executive Council (EC), supported by the Strategic Management Council (SMC),
- The Program Management Council (PMC), and
- The Mission Support Council (MSC).

Figure 1.4: Functional Relationships Between NASA's Governing Councils



Each council plays a key role in supporting NASA's performance management cycle. EC determines NASA's strategic direction, assesses Agency progress toward achieving the NASA Vision, and serves as the senior decision-making body for Agency-wide decisions. PMC is the senior decision-making body regarding NASA's program portfolio, and so guides execution of the strategy and performance framework. MSC ensures the Agency has the capacity to reach its goals. It is the senior decision-making body regarding all mission support policy and activities, including facilities, workforce, information technology, infrastructure, technical capabilities and associated investments and divestments, regardless of funding source.

In support of EC, SMC serves several functions. When delegated by EC, SMC provides:

- Advice and counsel to senior leadership on key issues of the Agency;
- Input on the formulation of Agency strategy; and
- Makes decisions regarding strategic direction and planning.

To augment this formal governance structure, NASA's Baseline Performance Review (BPR) serves as NASA's monthly senior performance management review, integrating Agency-wide communication of performance metrics, analysis, and independent assessment for both mission and mission support programs and activities. While BPR is not a decision-making body, members of the councils attend BPR, and performance information presented during BPR informs council activities. The review complements the Executive, Program Management, and Mission Support Councils by providing continuous performance monitoring between key council decisions.

THE STRATEGY AND PERFORMANCE FRAMEWORK

The strategic plan, as set by EC, establishes a strategy and performance framework that aligns short-term performance targets with the Agency's long-term commitments. The current strategy and performance framework consists of the elements of the strategic plan and annual performance plans as seen in Figure 1.5. The strategy and performance framework has five, distinct elements:

- Strategic goals,
- Outcomes,
- Objectives,
- Performance goals, including Priority Goals, and
- Annual performance goals.

The internal implementation plans of individual offices and NASA Centers flow from the framework. Internal implementation plans guide each entity's activities toward achieving performance goals and annual performance goals. Due to their technical nature, these plans generally remain internal to the Agency.



Figure 1.5: NASA's Strategy and Performance Framework

STRATEGIC PLAN

NASA's current <u>strategic plan</u>, published in 2011, reflects the top three levels in the strategy and performance framework. The strategic goals, outcomes, and objectives result from rigorous internal planning and external consultation with the Agency's stakeholders.

The Agency's senior leaders set the strategic plan to reflect the Agency's strategic direction and priorities, as agreed to with Congress and the Administration. Updates occur according to the timelines set by the Government Performance and Results Act (GPRA) Modernization Act (GPRAMA) of 2010. As such, the Agency plans to update its strategic plan in 2014 with input from stakeholders, including Congress and the Office of Management and Budget.

In accordance with GPRAMA, NASA also delivers its Agency Priority Goals with its strategic plan, to signify the importance of these ambitious, short-term goals in the overall achievement of NASA's strategy. Agency Priority Goals are discussed in more detail in "Performance Reporting and Planning."

ANNUAL PERFORMANCE PLANS

While the strategic plan primarily focuses on long-term activities, NASA's annual performance plans set short-term targets for programs, projects, and organizations through performance goals, Priority Goals, and annual performance goals. Performance goals and Priority Goals focus on planned progress over the next 18 months to five years. Annual performance goals align to NASA's budget themes and programs in the Congressional Justification. NASA publishes these measures in annual performance plans, which also identify each responsible program or office. The FY 2013 and 2014 Performance Plans are included in "Performance Reporting and Planning." In its performance plans, NASA also sets targets for mission

support activities that support program and project activities. These performance commitments span the mission support portfolio in a range of areas, including human capital, information technology, infrastructure, and operational processes.

Performance Management

Rigorous planning is followed by evaluation and reporting. Once NASA entities begin executing against commitments in the performance plan, Agency managers and performance analysts begin to monitor and evaluate performance. Internal reporting requirements drive the evaluation phase and call for analysis of results against planned performance. NASA continuously measures the Agency's progress in pursuit of its strategic goals, outcomes, and performance measures, and reports progress towards its targets to Congress and the public in the Annual Performance Report (APR). This year, the Agency shares its report combined with future annual performance plans, to provide a holistic view of NASA's performance.

The Agency monitors and evaluates performance toward plans and commitments using assessments. Through these assessments, managers identify issues, gauge programmatic and organizational health, and provide appropriate data and evidence to NASA decision-makers. NASA gathers and provides the data to management through the following type of assessments:

- On-going monthly and quarterly analysis and reviews of Agency activities;
- Annual assessments in support of budget formulation (for budget guidance and issue identification, analysis, and disposition);
- Annual reporting of performance, management issues, and financial position;
- Periodic, in-depth program or special purpose assessments; and
- Recurring or special assessment reports to internal and external organizations.

QUARTERLY REPORTING

Each quarter, program officials submit to NASA management a self-evaluation that includes a rating for each performance measure and the supporting information that justifies the rating. The results of quarterly performance assessments provide feedback to NASA leaders, allowing them to make course corrections through the year to maintain alignment with strategic goals. The quarterly performance reporting and supporting verification processes culminate in the annual performance report, and contribute to development of the Congressional Justification and performance plans.

ANNUAL ASSESSMENT RATING SCALES AND CRITERIA

NASA evaluates its progress toward achieving performance goals and annual performance goals against the Agency's standard rating scale, seen in Figures 1.6 and 1.7. NASA determines performance ratings based on a series of internal assessments that are part of ongoing monitoring of NASA's program and project performance. External entities, such as scientific review committees, aeronautics technical evaluation bodies, and OMB, validate the ratings prior to publication by NASA.

Rating	Rating Criteria for Performance Goals		
Green (On Track)	NASA achieved or expects to achieve the intent of the performance goal within the estimated timeframe. NASA achieved the majority of key activities supporting this performance goal.		
Yellow (At Risk)	NASA expects to achieve the intent of the performance goal within the timeframe; however, there is at least one likely programmatic, cost, or schedule risk to achieving the performance goal.		
Red (Not on Track)	NASA does not expect to achieve this performance goal within the estimated timeframe.		
White (Canceled or Postponed)NASA senior management canceled this performance goal and the Agency is no local activities relevant to this performance goal or the program did not have activities re- performance goal during the fiscal year.			

Figure 1.6: Performance Goal Rating Scale

Timeframe: When NASA will achieve the APG	Rating Criteria for Annual Performance Goal (APG) Types			
	Single Milestone or Deliverable	Multiple Deliverables, Targeted Performance, and Efficiencies	On-going Activities, Services, or Management Processes	Rating
Current FY as planned.	NASA achieved the event or the deliverable met the intent of the APG within the timeframe.	The program/project reached the stated numeric target.	The intended result of the program/project was achieved as defined by internally held success criteria.	Green
Achieve next FY (will not achieve this FY as planned).	NASA did not achieve this APG in the current fiscal year, but anticipates achieving it during the next fiscal year.			
Will not be achieved, but progress was made.	N/A	NASA failed to achieve this APG, but made significant progress as defined by reaching 80 percent of the target or other internally held success criteria.	The intended results of the program/project were not achieved in this fiscal year, but significant progress was accomplished, as defined by internally held success criteria.	Yellow
Will not be achieved.	NASA did not achieve the APG and does not anticipate completing it within the next fiscal year.	NASA achieved less than 80 percent of the target or other internally held success criteria.	Neither intended results nor significant progress were achieved. The progress toward the APG does not meet standards for significant progress for the internally held success criteria.	Red
Will not be achieved due to cancellation or postponement.	NASA senior management canceled this APG and the Agency is no longer pursuing activities relevant to this APG or the program did not have activities relevant to the APG during the fiscal year.			

Figure 1.7: Annual Performance Goal Rating Scale

MANAGING PERFORMANCE DATA

Data management keeps the performance management cycle in motion by fueling evaluations and driving evidence-based reports to leaders. In July 2012, NASA implemented the Performance Warehouse, a database designed in partnership with the Department of Treasury. The system leverages technology and best practices to collect, maintain, and analyze performance information. The Performance Warehouse standardizes data collection and archiving, streamlines performance reporting, and enables more data analytics. NASA uses this system to track performance metrics for the entire performance cycle, beginning with measure development through evaluation and reporting.

Beyond supporting NASA's internal management processes, these enhanced capabilities also provide a more efficient means to comply with legislative and executive branch requirements, such as preparing

machine-readable formats of performance information, and carrying out verification and validation of performance data.

In September 2012, OCFO launched the companion system, the Performance Dashboard, which further streamlines evaluation and reporting activities. The new tool automates ad-hoc performance analysis, which increases NASA's capacity for focused, in-depth performance evaluations. The tool also automates reports and plans, such as the annual performance report.

Using Evidence and Evaluation in Decision-Making

Laws, executive orders, and management "best practices" all dictate that organizations must set expectations for success and be accountable for achieving that success. Furthermore, agencies must demonstrate to stakeholders that their programs and activities do deliver the products or services expected, are managed and operated effectively (and efficiently), and continue to be relevant in a changing and dynamic environment. Collection and analysis of performance data and conduct of rigorous independent evaluation are essential in determining the success and validity of an investment.

- NASA monitors and assesses the engineering process of designing, building, and operating spacecraft and other major assets. Measures of performance for such investments tend to focus on comparisons of actual versus planned schedule and cost. The Agency continually monitors performance through the BPR, and additionally holds formal independent assessments as the project progresses through a series of gatekeeping "key decision points," or KDPs. Key decision points provide managers a time to review all aspects of performance and thoughtfully promote (or delay, or even terminate) work on a project. These points can occur at any time of the year, depending on the formulation, development, or construction plan.
- NASA's research programs often have broad goals, such as "understand the origin of the universe." To measure performance of these types of investments, NASA establishes and measures performance against smaller achievable goals that demonstrate a contribution to the knowledge on the subject. NASA conducts an assessment on these programs each year.
- NASA assesses technology research and development (R&D) programs against incremental milestones (technology readiness levels, or TRLs) in terms of research maturity and adoption. NASA regularly measures the TRL advancement of an individual technology investment, with overall technology portfolio assessments occurring each year.
- NASA's "operations" or support and service type programs generally assess progress on meeting their specific objectives, and can measure performance against targets for "output" or capacity of the activity, quantifiable estimates of improvement with aggressive targets (e.g., reducing operating costs by two percent in two years), or even customer satisfaction. These assessments tend to be annual in nature.

Evaluations drive decisions on a range of NASA investments, small and large. A series of decadal surveys and other analyses, conducted by the National Research Council of the National Academies, helps inform decisions about the Science investment portfolio and other aspects of NASA's R&D efforts. This external "evaluation" of user needs and requirements, in combination with performance assessment of on-going activities, helps ensure that NASA's research priorities and investments stay current with the needs of the research community. The Space Technology Roadmap is a similar planning tool, reflecting the R&D and technology needs of NASA, the government, and industry. NASA uses external peer review panels to

objectively assess and evaluate proposals for new work in the disciplines of research, technology development, and education. NASA often contracts internal and external evaluators to assess impact, efficiency and effectiveness, cost to benefit, and the relevance of work being performed. Evaluations are a routine business activity in the NASA fields of education, facilities maintenance and operations, procurement and contract operations, and logistics.

In addition to the program or theme-based evaluations, NASA also conducts evaluations across its portfolio. As a part of NASA's performance management cycle, NASA reports the results of those evaluation activities at regular interval to Agency leaders. The following sections highlight the evaluative methods employed by NASA to assess performance and performance improvement. Through this evidence-based strategic management, NASA has improved management oversight of project cost, schedule, technical, and institutional performance with the implementation of Cross Agency initiatives, policy adjustments, and other techniques. The "Performance Reporting and Planning" subsection documents how evaluation and reporting culminate in the Agency's annual performance report and plans. "Addressing Management Challenges and Improving Performance" provides an in depth discussion of NASA's evaluative approach. The subsection discusses these three aspects:

- NASA's evaluation methodology,
- The results of evaluations, and
- The effectiveness of previous improvement efforts.

The evaluation phase of the performance management cycle highlights the Agency's improvement opportunities. For example, the evaluation results could reveal a need for cross-Agency coordination efforts, increased oversight, or policy adjustment. Leveraging insights from the FY 2011 performance management cycle, NASA implemented tools and processes in FY 2012 that streamlined planning, evaluation, and reporting. In so doing, the Agency increased its capacity to focus on performance improvement in FY 2013.

Each quarter, NASA presents to senior leaders at BPR an evaluation and summary of performance goals based on evidence provided by programs. Additionally, an independent assessment team provides evaluations of technical, cost, schedule, and programmatic details for major spaceflight and technology projects and programs. OCFO also presents a summary of progress made toward achieving all performance measures, as well as a discussion of relevant performance issues.

Center and mission directorate-level offices and key Headquarters Offices support BPR. As an integrated review of institutional and program activities, BPR highlights interrelated issues that impact performance and program risk enabling senior management to quickly address issues, including referral to the governing councils for decision, if needed. The BPR forum fosters communication across organizational boundaries to address mutual concerns and interests. The objectives of the forum are to:

- Provide NASA senior leadership comprehensive, integrated, and objective information that describes the performance of the Agency's programs, projects, and institutional capabilities (i.e., the full portfolio at one time);
- Ensure open cross-functional communications among NASA's organizations to enhance Agency performance; and
- Identify and analyze performance trends and crosscutting or systemic issues and risks.

Management and Performance

NASA'S APPROACH TO PERFORMANCE MANAGEMENT

No matter the type of activity, NASA monitors performance with an eye to benefit received or to be received in the future. Results of performance assessments and evaluations inform decisions on program restructuring, initiation or termination, and changes in policy or management strategies. Across the board, NASA's FY 2014 budget request reflects prioritizations and decisions based on performance evidence and evaluations.