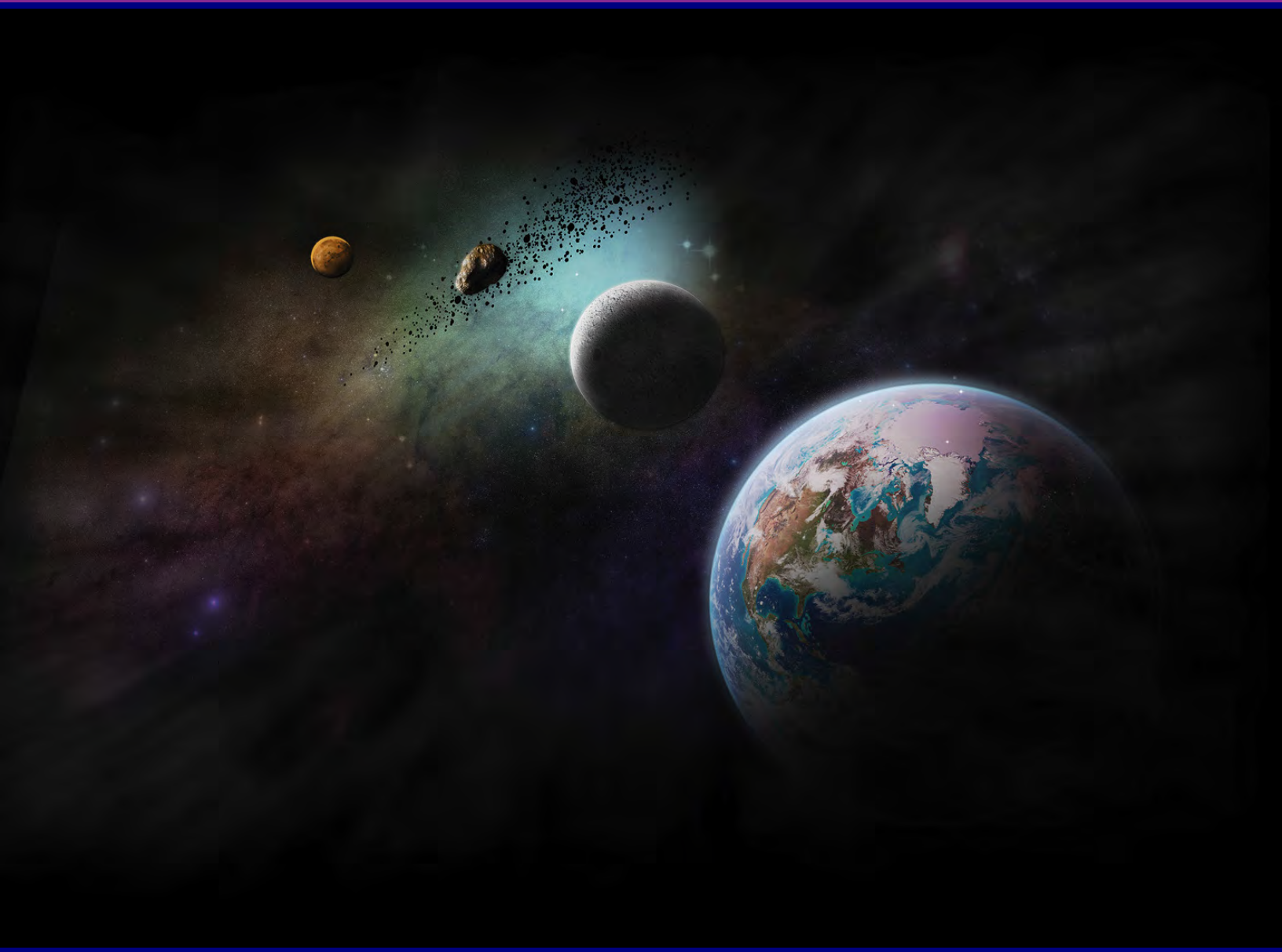
National Aeronautics and Space Administration



FY 2014 Agency Financial Report

www.nasa.gov

Cover Image Captions and Credits

Front Cover:

Outside Front Main Image: Artist concept of planets space. (Credit: NASA)

Outside Front Bottom Images (left to right): Crawler-Transporter Passes Milestone Test at NASA's Kennedy Space Center. (Credit: NASA); MAVEN Ready for Launch. (Credit: NASA); Pathfinding Operations for Orion Spacecraft at Kennedy Space Center. (Credit: NASA)

Inside Front: Orion Heat Shield Transported Aboard Super Guppy Plane. (Credit: NASA)

Rear Cover:

Outside Rear**:** Iberian Peninsula at Night. (Credit: NASA)

Message from the Administrator

November 14, 2014

I am proud to present NASA's fiscal year (FY) 2014 Agency Financial Report, summarizing our financial performance and progress toward achieving our Mission. It also provides insight into our stewardship of taxpayer dollars and the resources entrusted to NASA.

We are exploring the furthest reaches of space, monitoring Earth's vital signs, conducting research on the International Space Station (ISS), building the next premier space observatory, investing in a vibrant and growing American commercial space industry, and helping make the Next Generation Air Transportation System a reality. Our work is critical to the Nation's leadership in technology, innovation, exploration, and discovery. Efficient and effective financial management makes our mission possible. For FY 2014, NASA received an unmodified "clean" audit opinion on our financial statements. The report of the independent auditors is included in this Agency Financial Report. I am able to provide reasonable assurance that the performance and financial information in this report is reliable and complete.

In early 2014 we released our new Strategic Plan, outlining our mission to drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth. Our long-term goal is to send humans to Mars. To enable that goal we are developing new systems for the human exploration of deep space. In FY 2014, NASA made progress toward Exploration Flight Test (EFT)-1. This first flight test of the Orion spacecraft will launch aboard a Delta IV Heavy launch vehicle in early FY 2015. This year (FY 2014) we also accomplished major milestones in the development of the new Space Launch System (SLS), which will be the most powerful rocket in history. Along with Orion, these new capabilities will carry astronauts into deep space.

NASA is also working to ensure the Nation's continued access to low Earth orbit. Space Exploration Technologies Corporation (SpaceX) and Orbital Sciences Corporation are flying regular contracted resupply missions, delivering cargo and science experiments from a U.S. launch site to the International Space Station (ISS). NASA is partnering with U.S. companies to develop new commercial capabilities for transporting astronauts to and from the ISS by 2017.

Our robotic explorers also continue to produce astounding results, with over 120 spacecraft exploring Earth, our solar system, and beyond. The Kepler Space Telescope discovered the first Earth-sized planet orbiting within the "habitable zone" of a distant star, the zone around a star where water remains liquid on the surface of the planet. This is a promising first step toward finding a world like our own. We added to our scientific and exploration capabilities by launching the Mars Atmosphere and Volatile EvolutioN (MAVEN) mission in November 2013, the Global Precipitation Measurement (GPM) mission in February 2014, and the Orbiting Carbon Observatory (OCO)-2 in July 2014.

Transformative capabilities and cutting-edge technologies are being developed, tested and flown by NASA today. In June 2014, NASA flew the Low Density Supersonic Decelerator, testing new, full-scale parachutes and drag devices at supersonic speeds for future use in landing heavier spacecraft on Mars. Our technologies, partnerships, and education for the next generation contribute to the nation's innovation economy.

NASA's mission success is thanks to our multi-disciplinary team of diverse, talented people across our Centers. We are committed to nurturing an innovative environment that fosters teamwork and excellence. For the second year in a row, employees named NASA the Best Place to Work in the Federal Government among large agencies.

As shown in this report, we strive to put your tax dollars to efficient and innovative use. In the year ahead, NASA will continue to push the boundaries of exploration. Along the way we will make new scientific discoveries, develop new technologies and capabilities, and deliver tangible benefits to the public. If you would like more detail on our progress toward achieving our strategic goals, I invite you to read our Annual Performance Report, which will be released with NASA's Budget Estimates in early 2015.

Charles F. Bolden, Jr.
Administrator

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Image Caption: Caribbean Sea Viewed From the International Space Station - From the Earth-orbiting International Space Station, flying some 225 nautical miles above the Caribbean Sea in the early morning hours of July 15, NASA astronaut Reid Wiseman photographed this north-looking panorama that includes parts of Cuba, the Bahamas and Florida, and even runs into several other areas in the southeastern U.S. The long stretch of lights to the left of center frame gives the shape of Miami. (Credit: NASA)

Management Discussion and Analysis

Image Caption: Liftoff! OCO-2 Heads to Orbit - A United Launch Alliance Delta II rocket launches with the Orbiting Carbon Observatory-2 (OCO-2) satellite onboard from Space Launch Complex 2 at Vandenberg Air Force Base, California. OCO-2 will measure the global distribution of carbon dioxide, the leading human-produced greenhouse gas driving changes in Earth's climate. (Credit: NASA)

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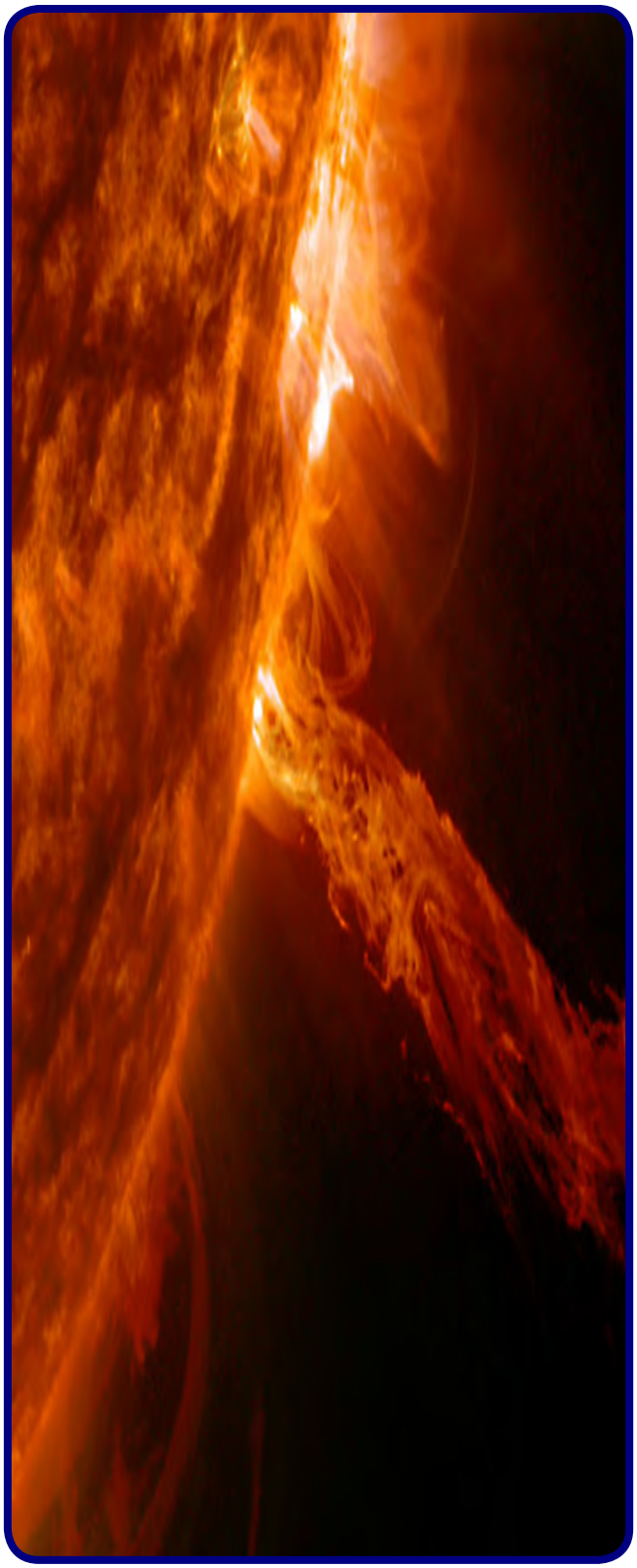
Hubble Sees a Dwarf Galaxy Shaped by a Grand Design. (Credit: ESA/NASA)

Welcome to NASA

This fiscal year (FY) 2014 Agency Financial Report (AFR) provides an overview of NASA's major programmatic and financial results for FY 2014. It integrates financial and program performance to demonstrate stewardship and accountability and highlights FY 2014 achievements.

NASA demonstrates stewardship with resources and accountability for results through compliance with the Chief Financial Officers Act (CFO Act) and the Government Performance and Results Act Modernization Act of 2010 (GPRAMA). Financial aspects of the Agency's business operations are accounted for according to the U.S. generally accepted accounting principles and Federal Accounting Standards Advisory Board standards.

NASA presents both performance and financial results of operations by strategic goal. Highlights of key program activities contributing to each strategic goal are provided in the Mission Performance discussion (page 15) of the AFR. A high-level summary of the linkage between program results and cost of operations is provided in the Statement of Net Cost (SNC), which can be found in the Financial



Section (page 71) of this AFR. The SNC presents comparative net cost of operations during FY 2014 and FY 2013 by strategic goal and for the Agency as a whole. In addition, the Financial Section explains any significant changes in NASA's financial condition from FY 2013 to FY 2014.

Financial systems that meet requirements of the Federal Financial Management Improvement Act (FFMIA) are vital to NASA's financial management program. The AFR describes NASA's compliance with the FFMIA, as well as the built-in checks and balances required by the Office of Management and Budget's (OMB) Circular A-123. Circular A-123 places responsibility for internal controls over financial reporting on Agency management for the purpose of safeguarding assets and improving efficiency and effectiveness of operations.

Finally, the AFR presents the Agency's audited FY 2014 and FY 2013 financial statements and the related independent auditor's financial statements audit opinion. The 2014 AFR can be found on NASA's Web site at:
http://www.nasa.gov/news/budget/

Image Caption: A stream of plasma burst out from the sun, but since it lacked enough force to break away, most of it fell back into the sun (May 27, 2014). This eruption was minor and such events occur almost every day on the sun and suggest the kind of dynamic activity being driven by powerful magnetic forces near the sun's surface. (Credit: NASA/Solar Dynamics Observatory)

Mission and Vision Statement

The National Aeronautics and Space Act of 1958 created NASA to provide for research into problems of flight within and outside the Earth's atmosphere and to ensure that the United States conducts activities in space devoted to peaceful purposes for the benefit of humankind.

In 2010, the President and the Congress unveiled an ambitious new direction for NASA, laying the groundwork for a sustainable program of exploration and innovation. This new direction extends the life of the International Space Station (ISS), supports the growing commercial space industry, and addresses important scientific challenges while continuing our commitment to robust human space exploration, science, and aeronautics programs. The strong bipartisan support for the NASA Authorization Act of 2010 confirms our essential role in addressing the Nation's priorities.

In 2014, NASA released a new strategic plan that builds upon the groundwork established in 2010 by outlining the Agency's vision for the future and providing a clear, unified, and long-term direction for all of NASA's activities. The plan is the foundation on which NASA will build and measure the success of its programs and projects. The Strategic Plan can be found on NASA's Web site at:
http://www.nasa.gov/sites/default/files/files/2014_NASA_Strategic_Plan.pdf

As established in the strategic plan, NASA's Vision and Mission are:

The NASA Vision

We reach for new heights and reveal the unknown for the benefit of humankind.

The NASA Mission

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

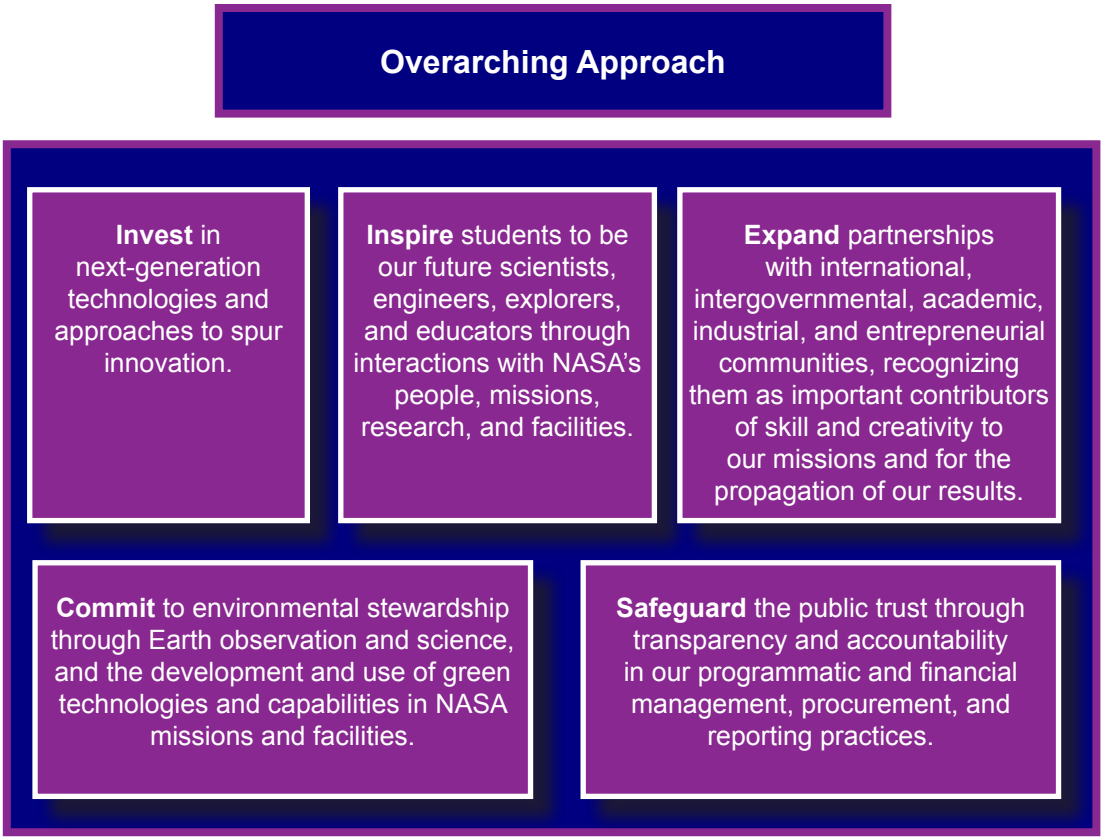
NASA's three strategic goals are:

1. Expand the frontiers of knowledge, capability, and opportunity in space.

2. Advance understanding of Earth and develop technologies to improve the quality of life on our home planet.

3. Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure.

NASA's overarching approach for achieving the vision contains five key strategies for governing the management and conduct of our aeronautics and space programs. These strategies are the standard practices that each organization within NASA employs in developing and executing their plans to achieve our vision. They also provide a framework that guides our support for other areas of National and Administration policy: government transparency; science, technology, engineering, and mathematics (STEM) education; energy and climate change; innovation; and increased citizen and partnership participation to help address the multitude of challenges faced by our Nation. The strategies listed below, help strengthen the Agency and support U.S. competitiveness on a global scale.



NASA also developed four new Agency Priority Goals for FY 2014 and FY 2015, consistent with the requirements of the GPRAMA. The statements for each Agency Priority Goal are as follows, and more information is available at: http://www.performance.gov/agency/national-aeronautics-and-space-administration?view=public#overview.

Agency Priority Goals

Human Exploration and Operations, Commercial Crew Program:
By September 30, 2015, the Commercial Crew Program will complete the first phase of certification efforts with Commercial Crew Transportation partners and will make measurable progress toward the second certification phase with industry partners while maintaining competition.

Human Exploration and Operations, International Space Station Program:
By September 30, 2015 , NASA will increase the utilization of the International Space Station internal and external research facility sites with science and technology payload hardware to 70 percent.

Science, James Webb Space Telescope Program:
By October 2018, NASA will launch the James Webb Space Telescope, the premier space-based observatory. To enable this launch date, NASA will complete the James Webb Space Telescope primary mirror backplane and backplane support structures and deliver them to the Goddard Space Flight Center for integration with the mirror segments by September 30, 2015.

Human Exploration and Operations, Exploration Systems Division:
By September 30, 2015, NASA will complete the Space Launch System, Orion, and Exploration Ground Systems Critical Design Reviews (CDRs), allowing the programs to continue to progress toward Exploration Mission (EM)-1 and EM-2 missions.

Organization

NASA's organizational structure is designed to accomplish its mission and provide a framework for sound business operations, management controls, and safety oversight. The Office of the Administrator provides the overarching vision and strategic direction for the Agency. The Agency's science, research, and technology development work is implemented through four Mission Directorates supported by one Mission Support Directorate:

Science Mission Directorate (SMD) manages the Agency's Science portfolio budget account and focuses on programmatic work on Earth, planetary, astrophysics, and heliophysics research. SMD engages the United States' science community, sponsors scientific research, develops and deploys satellites and probes in collaboration with NASA's international partners to answer fundamental scientific questions and expand our understanding of space. Additional information on SMD is available at: http://science.nasa.gov/.

Aeronautics Research Mission Directorate (ARMD) manages the budget account for the Agency's Aeronautics and Applied Research activities that improves current and future air travel. ARMD works to solve challenges that still exist in our nation's air transportation system, including: air traffic congestion, safety, and environmental impacts. Another significant goal of ARMD programs is to improve our national air transportation system by developing "green aviation" solutions. Additional information on the ARMD is available at: http://www.aeronautics.nasa.gov/.

Space Technology Mission Directorate (STMD) manages the Space Technology budget account, which supports crosscutting activities of the Office of the Chief Technologist. STMD develops crosscutting and pioneering new technologies and capabilities needed by the Agency to achieve its current and future missions. STMD programs complement other technology development activities in NASA's other Mission Directorates. In addition, STMD has a goal of developing technologies that support the broader space economy and other Government missions in space. Additional information on STMD is available at: http://www.nasa.gov/directorates/spacetech/home/index.html

Human Exploration and Operations Mission Directorate (HEOMD) manages the budget account for the Exploration and Space Operations portfolio. HEOMD manages development of the Space Launch System (SLS), 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 ISS, and communications systems and networks that enable deep space and near-Earth exploration. Additional information on the HEOMD is available at: http://www.nasa.gov/directorates/heo/home/index.html.

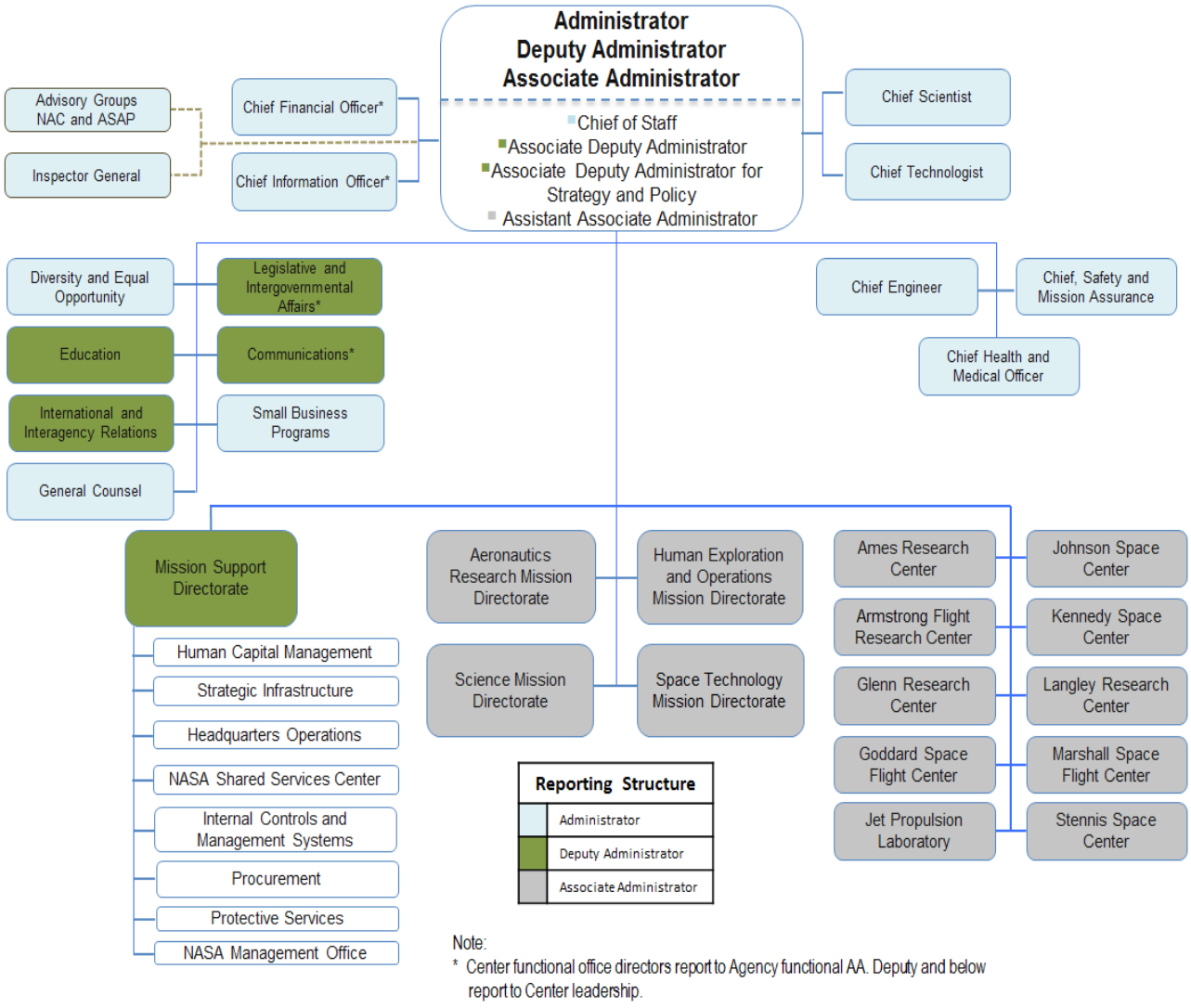
Mission Support Directorate (MSD) supports all NASA Missions in a crosscutting manner. For example, MSD manages the Cross Agency Support (CAS) and Construction and Environmental Compliance and Restoration (CECR) accounts which cut across all Mission Directorates. CAS and CECR accounts fund operations at Headquarters and the Centers as well as institutional and programmatic construction of facilities. MSD reports progress on major national initiatives to the Administrator and other senior Agency officials; provides independent reviews and/or investigations; and liaises with the public and other Federal agencies. MSD is based at Headquarters, but has representatives at the Centers to provide coordination and control. Additional information on the MSD is available at: http://msd.hq.nasa.gov/.

Office of Education (Education) develops and manages a portfolio of educational programs for students and teachers at all levels. Education seeks to develop a vibrant pool of future workforce for sustainable support of national and NASA mission by attracting and retaining students in STEM disciplines and raising public awareness of NASA's activities. To achieve these goals, Education works in partnership with other Government agencies, non-profit organizations, museums and the education community at large. Additional information on the Office of Education is available at:
http://www.nasa.gov/centers/armstrong/education/mission.html

The **Administrator's Staff Offices** support the Administrator's administrative responsibilities by providing a range of high-level guidance and support in critical areas like safety and mission assurance, technology planning, education, equal opportunity, information technology, financial administration, small business administration, international relations, and legislative and intergovernmental affairs. Additional information on the Administrator's Staff Offices is available at: http://www.nasa.gov/about/org_index.html.

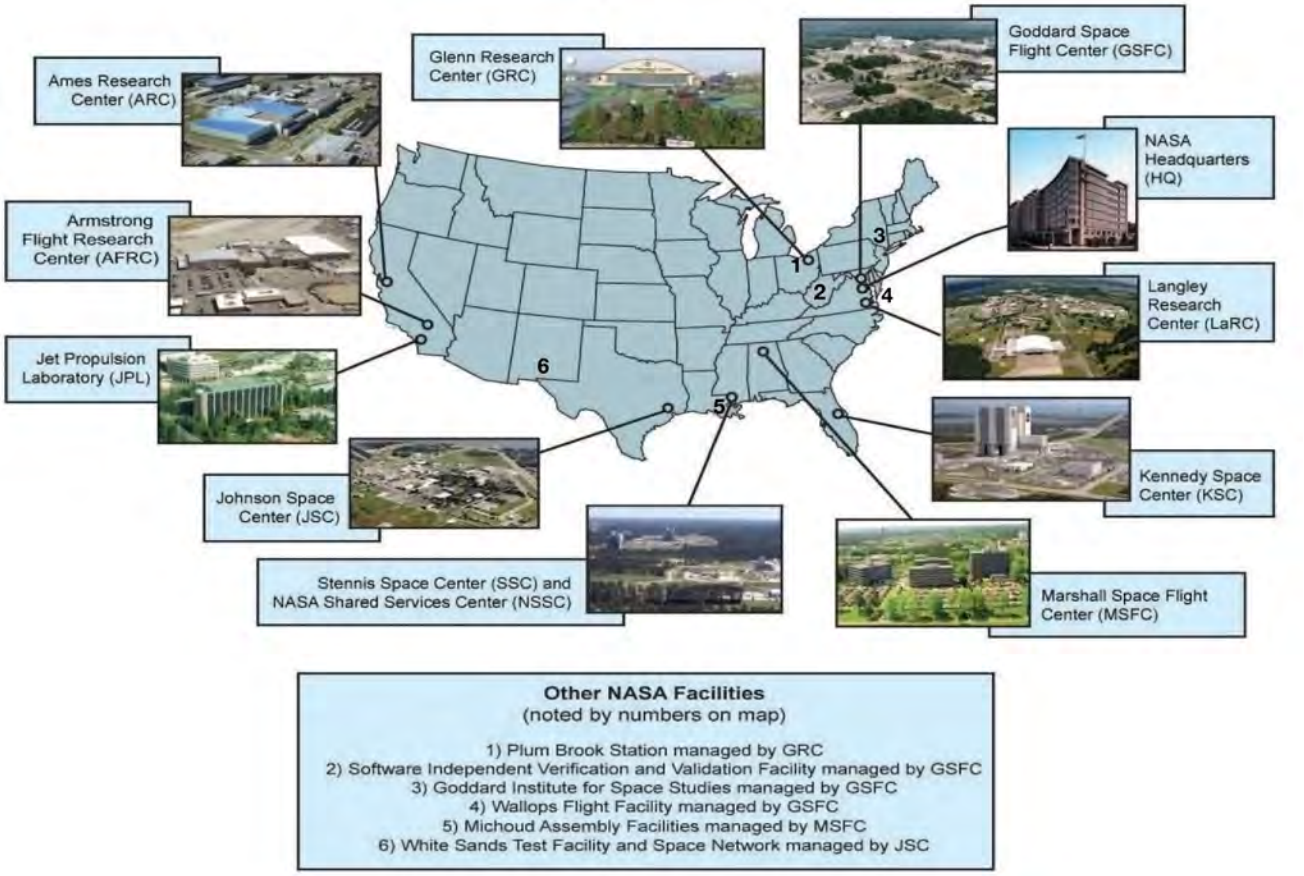
Administratively, NASA is organized into one Headquarters Office located in Washington, DC, nine operating Centers located across the country, and the Jet Propulsion Laboratory, a Federally funded research and development center operated under a contract with the California Institute of Technology. NASA works in partnership with academia, the private sector, state and local governments, other Federal agencies, and a number of international organizations to support and achieve its mission.

Organizational Structure



Centers and Facilities Nationwide

Under the leadership of the Administrator, NASA offices at Headquarters provide overall guidance and direction to the Agency. NASA's Centers 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.



Other NASA Facilities
(noted by numbers on map)

1) Plum Brook Station managed by GRC
2) Software Independent Verification and Validation Facility managed by GSFC
3) Goddard Institute for Space Studies managed by GSFC
4) Wallops Flight Facility managed by GSFC
5) Michoud Assembly Facilities managed by MSFC
6) White Sands Test Facility and Space Network managed by JSC

Note: The Jet Propulsion Laboratory (JPL) is a federally funded research and development center in Pasadena, California. The California Institute of Technology manages JPL.

The NASA Shared Services Center (NSSC) was established in March 2006 to provide all NASA centers timely, accurate and cost-effective support services in the areas of financial management, human resources, information technology, procurement and business support services.

Workforce

As of the end of FY 2014, NASA employed more than 17,500 civil servants, including full-time, part-time, term appointees, student, and other non-permanent workers at nine Centers, Headquarters, and the NASA Shared Services Center (NSSC). In addition, approximately 4,500 full-time equivalent employees perform NASA-funded work as employees of the Jet Propulsion Laboratory, operated by the California Institute of Technology. More information about NASA's workforce is available at: https://wicn.nssc.nasa.gov/. The NASA Office of Human Capital Management (OHCM) is responsible for planning and managing the Agency's workforce to ensure that the right skills are available to support Agency mission.

NASA's talented and engaged people are our greatest resource. NASA's mission requires great responsibility and the continued need for a highly skilled, agile, inclusive, and innovative workforce. While many drivers of a positive workplace culture contribute to employee engagement and mission accomplishment, analysis has shown that three areas have the greatest potential to increase innovation given our current environment. The NASA Strategic Management Council has agreed to focus on these three principal areas that will help to embed innovation in the NASA culture.

- Recognizing and rewarding innovative performance: Reward and appreciate employees for their innovative performance and contributions to their workplace.

- Engaging and connecting the workforce: Engage employees in the NASA mission and enable them to cooperate, collaborate, and network with one another.

- Building model supervisors and leaders: Develop supervisors and leaders who view developing employees as an important and productive use of time.

NASA cares about the environment in which employees work. Direct attention to the NASA work environment, workforce, and culture through both inclusion and innovation strategies are critical to achieving NASA' s mission.

Image Caption: Contamination control engineers conduct a review of the James Webb Space Telescope's Mid-Infrared Instrument, as part of the standard receiving inspection. They are looking for the tiniest traces of dust or contamination which would have to be remedied because cleanliness is critical for such a sensitive instrument. (Credit: NASA/Chris Gunn)

Core Values

NASA's tradition of excellence is rooted in the four uncompromising shared core values of safety, integrity, teamwork, and excellence, as well as the firm belief that failure is not an option.

Safety: NASA's constant attention to safety is the cornerstone upon which we build mission success. We are committed, individually and as a team, to protecting the safety and health of the public, our team members, and those assets that the Nation entrusts to us.

Integrity: NASA is committed to maintaining an environment of trust, built upon honesty, ethical behavior, respect, and candor. Our leaders encourage this virtue in the NASA workforce by fostering an open flow of communication on issues among all employees without fear of reprisal. At NASA, we regard and reward employees for demonstrating integrity. Building trust through ethical conduct as individuals and as an organization is a necessary component of mission success.

Teamwork: NASA's most powerful asset for achieving mission success is a multidisciplinary team of diverse, competent people across NASA Centers. Our approach to teamwork is based on a philosophy that each team member brings unique experience and important expertise to project issues. Recognition of and openness to that insight improves the likelihood of identifying and resolving challenges to safety and mission success. We are committed to creating an environment that fosters teamwork and processes that support equal opportunity, collaboration, continuous learning, and openness to innovation and new ideas.

Excellence: To achieve the highest standards in engineering, research, operations, and management in support of mission success, NASA is committed to nurturing an organizational culture in which individuals make full use of their time, talent, and opportunities to pursue excellence in both the ordinary and the extraordinary.

FY 2014 In Review

Set of NanoRacks CubeSats Deployed From International Space Station. (Credit : NASA)

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Mission Performance

Performance Overview

NASA has chosen to produce an Agency Financial Report (AFR) and Annual Performance Report (APR). NASA will publish its FY 2014 APR concurrently with its Congressional Budget Justification and will post it on NASA's Web site at http://www.nasa.gov by February 2015.

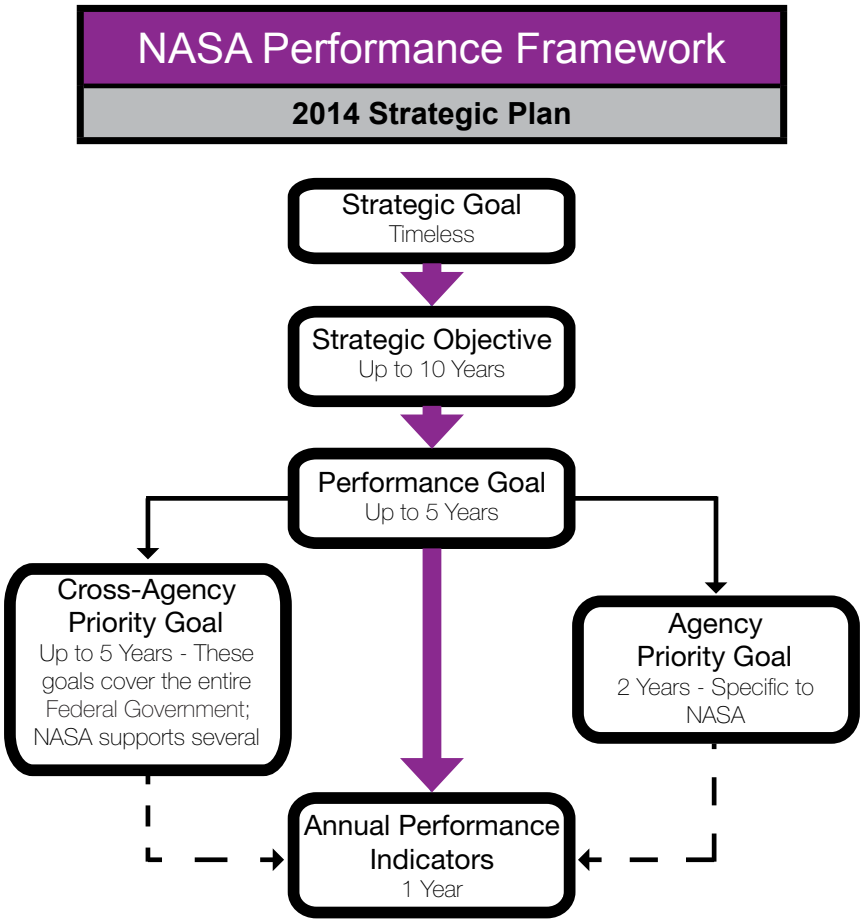
NASA has a culture of performance and data-driven performance management, as recognized by Congress, the Government Accountability Office (GAO), and the Office of Management and Budget (OMB). NASA continues to work hard to improve its performance management system to increase accountability, transparency, and oversight, adding sophistication and discipline to this system. This leads to more consistent performance results across NASA's missions, helping to improve the use of performance information and makes the best use of the resources entrusted to the Agency by the American people.

In FY 2014, NASA released its new 2014 Strategic Plan. NASA's strategic goals and objectives are as follows:

Strategic Goal 1	Strategic Goal 2	Strategic Goal 3
		
Expand the frontiers of knowledge, capability, and opportunity in space	**Advance understanding of Earth and develop technologies to improve the quality of life on our home planet**	**Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure**
By empowering the NASA community to…	By engaging our workforce and partners to…	By working together to…
Objective 1.1: Expand human presence into the solar system and to the surface of Mars to advance exploration, science, innovation, benefits to humanity, and international collaboration.	**Objective 2.1:** Enable a revolutionary transformation for safe and sustainable U.S. and global aviation by advancing aeronautics research.	**Objective 3.1:** Attract and advance a highly skilled, competent, and diverse workforce, cultivate an innovative work environment, and provide the facilities, tools, and services needed to conduct NASA's missions.
Objective 1.2: Conduct research on the International Space Station (ISS) to enable future space exploration, facilitate a commercial space economy, and advance the fundamental biological and physical sciences for the benefit of humanity.	**Objective 2.2:** Advance knowledge of Earth as a system to meet the challenges of environmental change, and to improve life on our planet.	**Objective 3.2:** Ensure the availability and continued advancement of strategic, technical, and programmatic capabilities to sustain NASA's Mission.
Objective 1.3: Facilitate and utilize U.S. commercial capabilities to deliver cargo and crew to space.	**Objective 2.3:** Optimize Agency technology investments, foster open innovation, and facilitate technology infusion, ensuring the greatest national benefit.	**Objective 3.3:** Provide secure, effective, and affordable information technologies and services that enable NASA's Mission.
Objective 1.4: Understand the Sun and its interactions with Earth and the solar system, including space weather.	**Objective 2.4:** Advance the Nation's STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers, and faculty in NASA's missions and unique assets.	**Objective 3.4:** Ensure effective management of NASA programs and operations to complete the mission safely and successfully.
Objective 1.5: Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.		
Objective 1.6: Discover how the universe works, explore how it began and evolved, and search for life on planets around other stars.		
Objective 1.7: Transform NASA missions and advance the Nation's capabilities by maturing crosscutting and innovative space technologies.		

At the heart of NASA's strategic goals and objectives remain the core missions of human space exploration, Earth and space science, aeronautics, and technology development. The strategic plan focuses on creating a future that leverages our preeminence in science and technology to extend humanity's reach into space, improve life on Earth, protect our home planet, encourage innovation, and strengthen the American economy. In particular, we are emphasizing building capabilities for human space exploration, commercial space transportation, the use of the International Space Station (ISS) for research, and developing the James Webb Space Telescope (JWST).

NASA sets near-term performance goals (PGs), which are targets within the four-year span of the Strategic Plan, as well as annual performance indicators (APIs) to measure and communicate progress towards achieving the Agency's Vision and Mission. These PGs and APIs are aligned to our strategic goals and objectives. Together, the APIs, PGs, Strategic Objectives, and Strategic Goals form NASA's strategy-performance framework, along with Cross-Agency Priority (CAP) Goals and Agency Priority Goals (APGs).



In this FY 2014 Agency Financial Report, NASA presents a high-level summary of performance, reflecting preliminary year-end assessments of progress toward the PGs and APIs. Final ratings and more detailed information will be provided in the Annual Performance Report (APR) in February 2015 at: http://www.nasa.gov

NASA determines these 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 peer review committees and aeronautics technical evaluation bodies, validate the ratings prior to publication in the APR.

Generic Performance Goal and Annual Performance Indicator Rating Criteria	
Green (On Track)	NASA achieved or expects to achieve the intent of the PG or API in the planned timeframe and the majority of activities, milestones, deliverables, or results.
Yellow (At Risk)	NASA expects to achieve the intent of the PG or API in the planned timeframe and achieve the majority of activities, milestones, deliverables, or results; however, there is at least one likely programmatic, cost, or schedule risk.
Red (Not on Track)	NASA does not expect to achieve the PG or API within the planned timeframe or does not expect to achieve the intended results or progress.
White (Cancelled or Postponed)	NASA senior management cancelled this PG or API and the Agency is no longer pursuing relevant activities during the fiscal year.

Performance Summary

In FY 2014, NASA reviewed progress toward 72 performance goals and 120 APIs. NASA provided the FY 2014 Performance Plan online at: http://www.nasa.gov in April 2013. Since then, NASA updated the order, number, and content of the FY 2014 performance goals and APIs in light of the new Strategic Plan.

The summary of NASA's preliminary assessment of progress by strategic objective is provided below. The Agency will release final ratings with the APR in February 2015.

Performance Goals and Annual Performance Indicators

FY 2014 Preliminary Ratings by Strategic Goal

Strategic Goal 1

Expand the frontiers of knowledge, capability, and opportunity in space.

Objective	PGs	APIs
1.1	4	8
1.2	6	10
1.3	2	4
1.4	4	7
1.5	6	10
1.6	5	6 / 1
1.7	3	5
Total	30	51
Summary	100% Green	98% Green 2% Yellow

Strategic Goal 2

Advance understanding of Earth and develop technologies to improve the quality of life on our home planet.

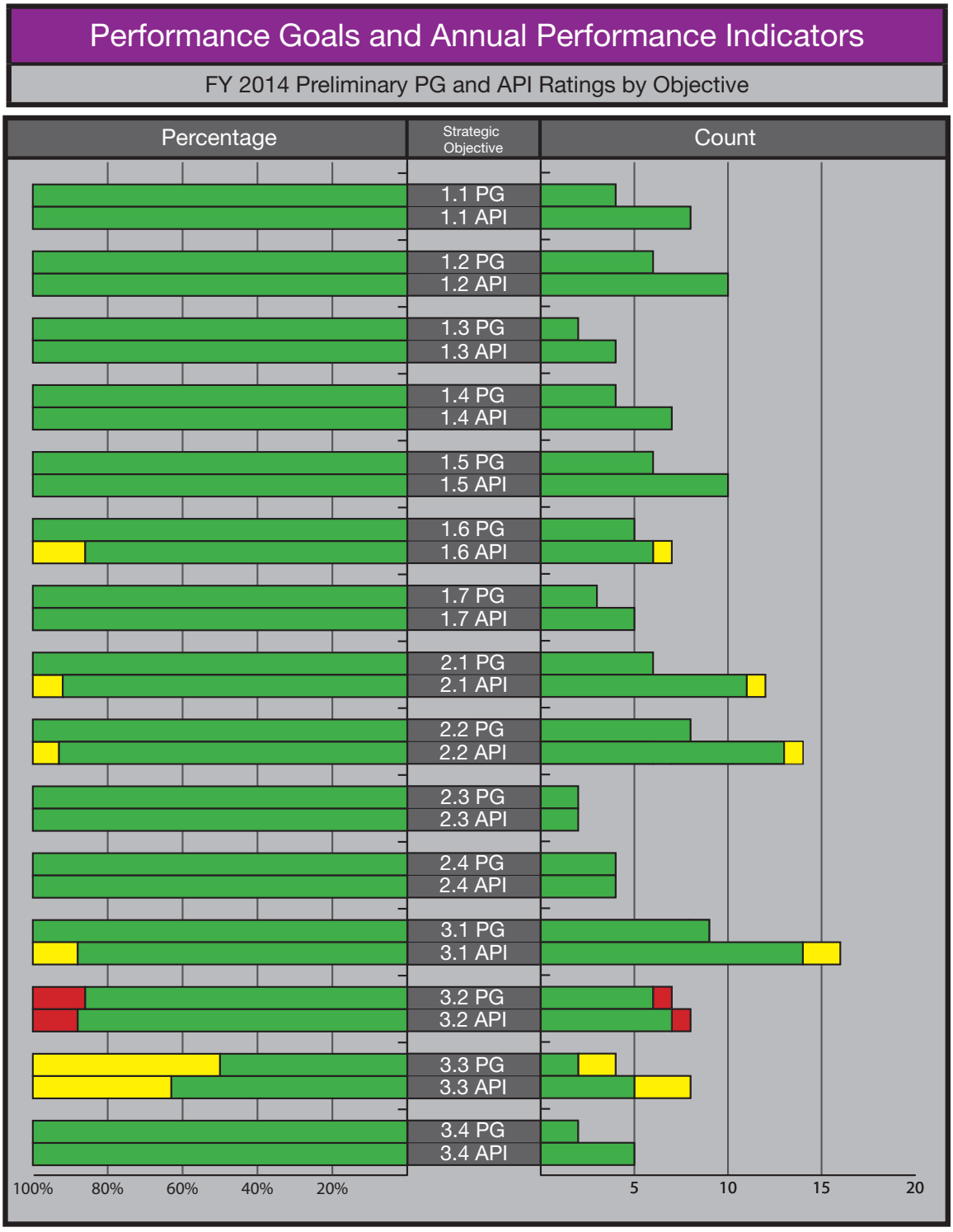
Objective	PGs	APIs
2.1	6	11 / 1
2.2	8	13 / 1
2.3	2	2
2.4	4	4
Total	20	32
Summary	100% Green	94% Green 6% Yellow

Strategic Goal 3

Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure.

Objective	PGs	APIs
3.1	9	14 / 2
3.2	6 / 1	7 / 1
3.3	2 / 2	5 / 3
3.4	2	5
Total	22	37
Summary	86% Green 9% Yellow 5% Red	84% Green 14% Yellow 3% Red

Note that these ratings reflect the preliminary year end assessment of progress. Final ratings will become available in February 2015 in the Annual Performance Report. Note that because of rounding, percentages may not add up to 100%. The red ratings for Objective 3.2 relate to the Space Network Ground Segment Sustainment project, which has experienced cost and schedule challenges. Details on how NASA is addressing these issues will be included in the Annual Performance Report.



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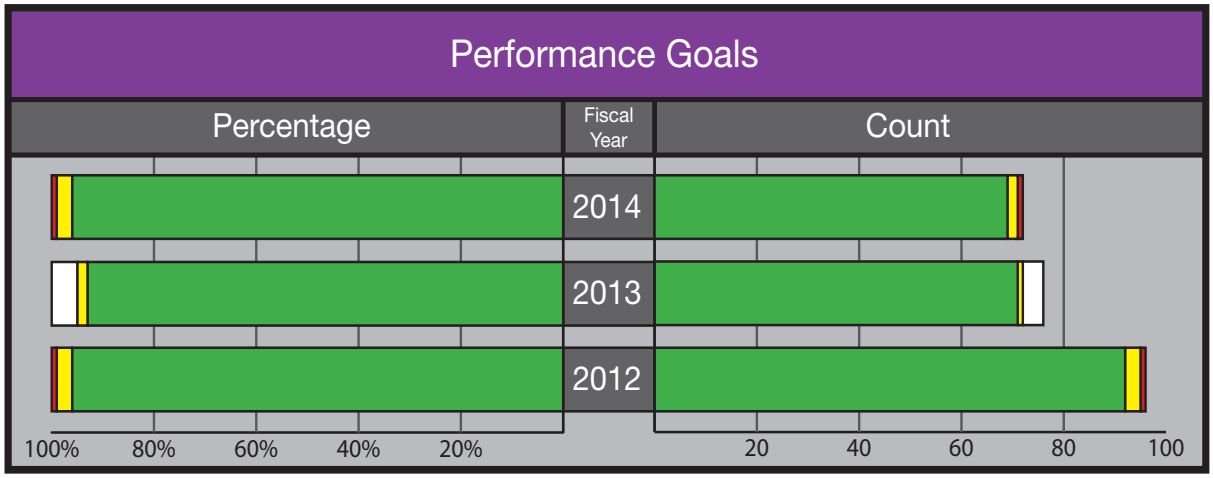
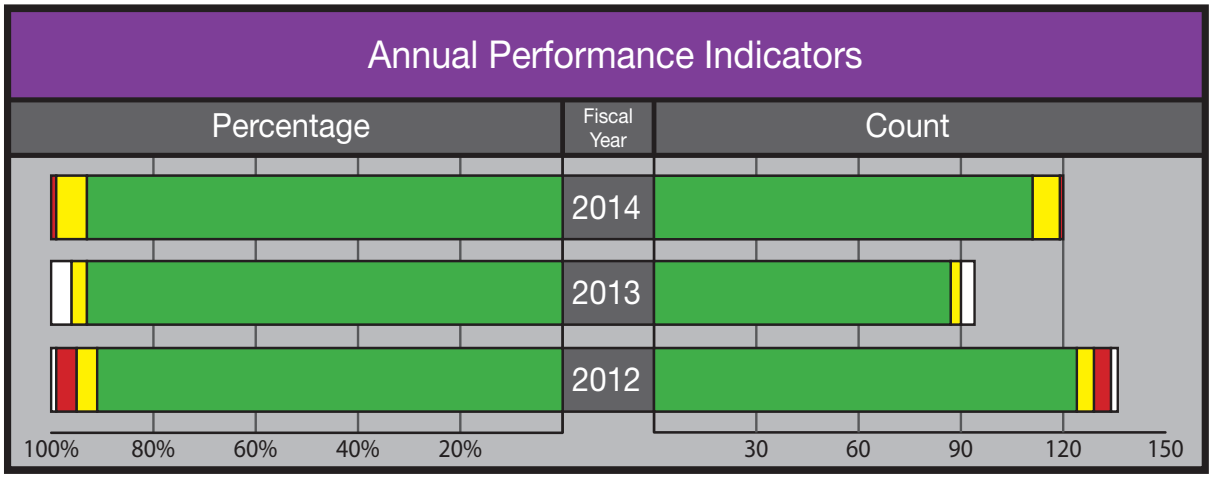
Performance Goals and Annual Performance Indicators

Trending Over Last Three Fiscal Years





Note that as with the other tables, this table uses preliminary ratings data for FY 2014. Final ratings will become available in February 2015 in the Annual Performance Report.

Strategic Goals and Highlights

Strategic Goal 1:
Expand the frontiers of knowledge, capability, and opportunity in space.

NASA's enduring and core goal, for over 50 years, is to expand the frontiers of knowledge, capability, and opportunity in space and continually challenge the boundaries of science, technology, and imagination. This goal includes NASA's objectives for human exploration, the International Space Station (ISS), partnerships with U.S. industry, heliophysics, planetary science, astrophysics, and space technology development.

Strategic Objective 1.1: Expand human presence into the solar system and to the surface of Mars to advance exploration, science, innovation, benefits to humanity, and international collaboration.

NASA is entering a new era in human spaceflight: exploration beyond low Earth orbit (LEO), implementing a multiple destination exploration strategy with a capability-driven approach. The Human Exploration and Operations (HEO) Mission Directorate's Exploration Systems Development programs are creating the first components of the architecture needed for human exploration beyond LEO. The first, foundational elements include the Orion Multi-Purpose Crew Vehicle, the Space Launch System (SLS), and Exploration Ground Systems (EGS). Programs within this Objective also develop the technologies and capabilities for in-space propulsion, in-space operations, long-duration habitation, and other systems to support humans in hostile environments.

Preparing Orion for Exploration Flight Test-1

In December 2014, NASA plans the first launch of the Orion spacecraft on Exploration Flight Test-1 (EFT-1), aboard a Delta IV Heavy rocket. This is the first step to using the Orion spacecraft to take astronauts beyond LEO and into deep space. Orion will travel farther into space than any human spacecraft has gone in more than 40 years. The uncrewed EFT-1 vehicle will travel up to 3,600 miles above the Earth's surface, in a four-and-a-half-hour mission to test systems critical for human survival in future missions to deep space. After two orbits, Orion will reenter Earth's atmosphere at almost 20,000 miles per hour before its parachute system deploys to slow the spacecraft prior to splashdown in the Pacific Ocean. It should be noted that employing a Delta IV Heavy rocket satisfies the launch performance requirements of EFT-1, but does not meet launch performance requirements of future Exploration Missions.

In FY 2014, the team assembled all the parts, components, structures, and mechanisms at Kennedy Space Center (KSC) in Florida into the Orion crew module (CM), service module (SM), and launch abort system (LAS). Once the heatshield was completed and attached to the CM, the team stacked the modules together, and performed the final testing of the spacecraft.

More information can be found at:
http://www.nasa.gov/exploration/systems/mpcv/index.html

Image Caption: The Orion crew module for EFT-1 shown in the Final Assembly and System Testing (FAST) Cell, positioned over the service module just prior to mating the two sections together. The FAST cell is where the integrated crew and service modules are put through their final system tests. (Credit: NASA/Rad Sinyak)

Morpheus/Autonomous Landing and Hazard Avoidance Technology (ALHAT) successful flight demonstration

The goal of the Morpheus/ALHAT Project is to complete a successful autonomous flight demonstration of the ALHAT hazard detection and avoidance and precision landing system on the Morpheus vehicle test bed. After several developmental free flights, the Morpheus/ALHAT vehicle successfully demonstrated autonomous, closed-loop ALHAT flight operations by flying nearly 600 meters down range on May 28, 2014. In real-time, as it was flying, the vehicle autonomously identified and safely landed on the test bed at KSC. For future robotic and human missions requiring landers, this technology offers the potential for reusable lander technologies with non-toxic propellants, assurance of safe landing sites on a wide variety of terrain and surface conditions with improved pinpoint landing accuracy, and lander system affordability.

Image Caption: The Morpheus lander ignites its methane and oxygen-powered engine and lifts off to begin a free flight test at NASA's KSC in Florida. The Johnson Space Center-based project is testing new technologies in propulsion and guidance systems in the unique testbed. (Credit: NASA/Frankie Martin)

Other achievements in FY 2014 include:

- Completion of key developmental milestones, including the Critical Design Review (CDR) of the SLS Core Stage in July 2014 and the Preliminary Design Review (PDR) for the Exploration Ground Systems program in March 2014.

- NASA also continued to plan for an initial Asteroid Redirect Mission to capture a small asteroid with a robotic spacecraft and redirect it into a stable orbit around the Moon.

Strategic Objective 1.2: Conduct research on the International Space Station (ISS) to enable future space exploration, facilitate a commercial space economy, and advance the fundamental biological and physical sciences for the benefit of humanity.

The ISS is the world's only orbiting, microgravity research and development (R&D) laboratory, where researchers can perform multidisciplinary research and technology development to prepare for our exploration of the solar system. ISS operations are critical to achieving NASA's and the Nation's goals in science, technology, and human spaceflight.

ISS Capabilities Enhanced Through Commercial Cargo Delivery Systems

This year, NASA and its commercial resupply service suppliers made great progress in establishing routine U.S. resupply to the ISS, through successful launches of the two domestic commercial cargo transportation systems. These capabilities will ensure a robust national capability to deliver critical science research to orbit, allowing us to maximize its potential, deliver critical benefits to our Nation and the world, and maintain American

leadership in space. These transportation systems significantly increase NASA's ability to conduct new science investigations on the only laboratory in microgravity.

Space Exploration Technologies (SpaceX) completed its fourth contracted resupply flight on September 22, 2014, delivering science and technology development hardware, crew supplies, and vehicle spares. This resupply mission also served as a high point for the scientists that utilize the unique attributes of space, providing the capability to return research investigation samples to Earth for analysis. Orbital Sciences Corporation (Orbital), the second company to send a commercial cargo craft to the space station, completed its first two contracted resupply missions delivering research resupply, crew supplies, and vehicle spares to the station.

With commercial cargo vehicles regularly serving the space station, the announcement by the Obama Administration to support the extension of the orbiting laboratory to at least 2024 provides the station a decade to help transition low Earth orbit from exclusive to accessible and offers scientists and engineers the time they need to ensure the future of exploration, scientific discoveries, and economic development. The ability to extend our window of discovery through at least 2024 presents important new opportunities to develop the tools we need for future missions to deep space while reaping large benefits for humanity. Expanding the timeframe for testing essential technologies and hardware related to long-duration journeys, such as to an asteroid or Mars, is the first step in exploration.

For more information, see:
http://www.nasa.gov/mission_pages/station/main/index.html

Image Caption: SpaceX completed its fourth contracted resupply flight with its Dragon spacecraft, delivering science and technology development hardware, crew supplies, and vehicle spares. (Credit: NASA)

Image Caption: Orbital Sciences, the second company to send a commercial cargo craft to the space station, completed its first two contracted resupply missions delivering research resupply, crew supplies, and vehicle spares to the ISS with Cygnus. (Credit: NASA)

Other FY 2014 achievements include:

- Following nearly two years of effort in cultivating relationships and connections with the venture capital and technology incubator communities, in 2014 the Center for the Advancement of Science in Space (CASIS) was able to establish agreements with several high-profile organizations, forming a promising basis for future non-governmental investments in space research.

- Utilization of the ISS was broadened to capitalize on the external unpressurized capabilities of the station. SpaceX-3 and SpaceX-4 launched powered technology demonstration payloads in the Dragon trunk. The high definition Earth viewing cameras, laser communications system, and scatterometer will pave the way for additional payloads and initiate NASA's use of the orbiting laboratory as a 24/7 Earth-observing and technology demonstration platform.

- ISS reached a milestone in early July of 5,000 days of humans living and working aboard the station. Since research began in November 2000, more than 1,550 investigations and 24,000 hours of research have been conducted in biology, physical science, technology, human physiology, Earth and space science, and student experiments. For more information, see: http://www.nasa.gov/iss-science

- Eighty-two countries around the world have participated in ISS research and education activities to date, and 214 people have lived and worked on the ISS.

Strategic Objective 1.3: Facilitate and utilize U.S. commercial capabilities to deliver cargo and crew to space.

U.S. commercial space transportation capabilities will provide safe, reliable, and cost effective access to and from LEO and the ISS for crew and cargo. Partnerships with

American industry to enable U.S. commercial crew transportation to LEO will stimulate commercial industry, promote job growth, and expand knowledge, as well as supply the ISS.

Through the Commercial Crew program, NASA is providing technical and financial support to industry providers during the development phase of their crew transportation systems, while certifying providers' transportation systems to carry NASA astronauts to and from the ISS.

In FY 2014, NASA and its American industry partners made great strides in delivering cargo to the ISS and developing the capabilities to transport crew members.

NASA selects U.S. industry partners to continue commercial crew transportation system development and certification efforts

In September 2014, NASA selected Boeing and SpaceX to transport future Space Station crews to and from the ISS using their CST-100 and Crew Dragon spacecraft, respectively. The Commercial Crew Transportation Capability (CCtCap) fixed price contracts are designed to complete partner commercial crew transportation system design and NASA certification for those systems to carry astronauts into orbit. Once certification is complete, NASA plans to use these systems to ferry astronauts to the ISS and return them safely to Earth.

NASA's Commercial Crew Program is facilitating this effort to ensure partner systems meet NASA requirements and are safe, prior to carrying government astronauts. The U.S. missions to the ISS following certification will allow the station's current crew of six to grow, enabling the crew to conduct more research aboard the unique microgravity laboratory.

Other key achievements in FY 2014 include:

- In May 2014, NASA's Commercial Crew Program and industry partners achieved a critical milestone in the development of next-generation American space transportation systems that are safe, reliable, and cost-effective with the completion of the Certification Products Contracts (CPC). Under the contracts, Boeing, Sierra Nevada Corporation Space Systems, and SpaceX completed reviews detailing how each company plans to meet NASA's certification requirements to transport space station crew members to and from the ISS.

Strategic Objective 1.4: Understand the Sun and its interactions with Earth and the solar system, including space weather.

The domain of heliophysics ranges from the interior of the Sun, to the upper atmosphere and near-space environment of Earth (above 50 kilometers), and outward to a region far beyond Pluto, where the Sun's influence wanes against the forces of interstellar space. Earth and the other planets of our solar system reside in this vast extended atmosphere of the Sun, called the heliosphere, which is made of electrified and magnetized matter entwined with penetrating radiation and energetic particles.

The emerging science of interplanetary space weather is crucial to NASA's human and robotic exploration objectives beyond Earth's orbit. Humans are presently confined to LEO, where the planetary magnetic field and the body of Earth itself provide substan-

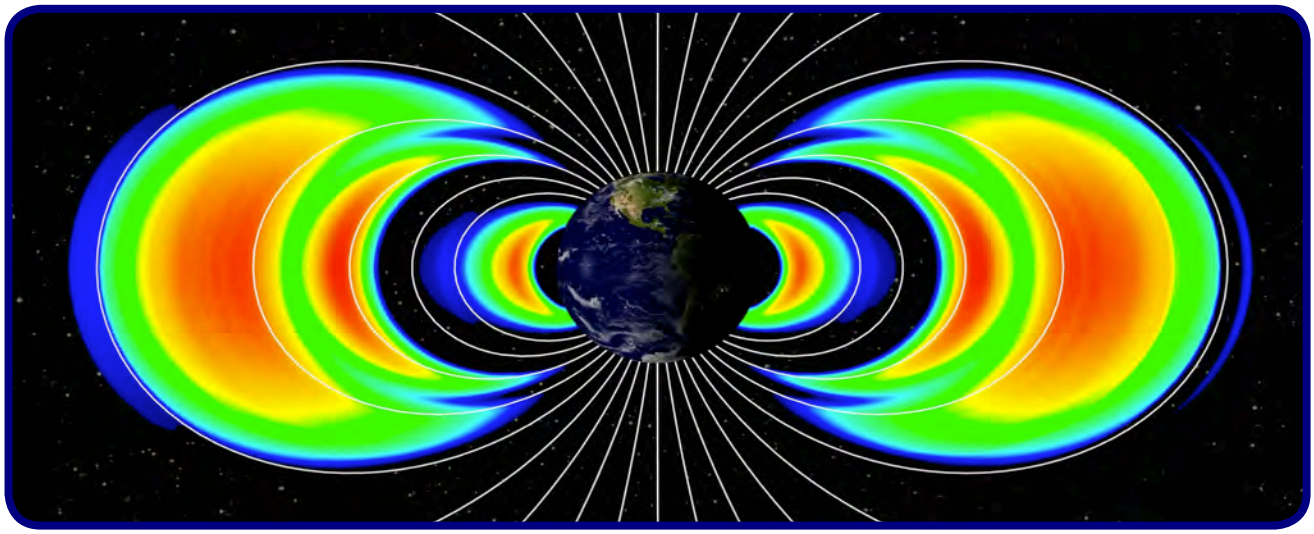
tial protection against solar storms. Eventually, though, astronauts will travel to distant places where natural shielding is considerably less. Our new long-term exploration initiatives directly rely on our ability to successfully understand, predict, and mitigate impacts of interplanetary space weather.

Van Allen Probes Achieve Mission Success

On March 26, 2014, NASA declared the Van Allen Probes mission – designed to explore and unlock the mysteries of Earth's radiation belts – an official success. This certification comes just one year, six months, and 27 days into the two-year primary mission of the twin spacecraft, which orbit Earth roughly every nine hours. The Van Allen Probes mission met and surpassed the requirements for scientific instrument performance, mission operations, and scientific progress needed to achieve mission success.

Beginning with the discovery of a transient third radiation belt just days after the Van Allen Probes launched on August 30, 2012, the mission has produced many findings that are altering our knowledge of the belts and how they operate. The spacecraft have revealed a massive particle accelerator in the heart of the belts; proven that electrons in the belt are undergoing strong local acceleration from very low frequency plasma waves; discovered electric field transients called double layers that may energize the seed particle population that becomes the radiation belt population; provided data that can improve space weather models, which can benefit space-based technologies and human spaceflight; and shown that persistent structures caused by Earth's rotation exist in the inner belt, a mechanism previously thought to be incapable of such an effect.

All of these findings are changing much of what we thought we knew about the radiation belts and fundamental plasma physics. For more information, see: http://www.nasa.gov/vanallenprobes



Shortly after launch on August 30, 2012, NASA's twin Van Allen Probes discovered a previously unknown transient third radiation belt around Earth. The image was created using actual data from the Relativistic Electron-Proton Telescopes (REPT) on the Van Allen Probes and shows the new belt as the middle yellow and red arc of the three seen on each side of the Earth. (Credit: JHU/APL, REPT data/LASP)

Other key FY 2014 achievements include:

- Interface Region Imaging Spectrograph (IRIS) spacecraft, launched in June 2013, provided observations of the low level of the Sun's atmosphere, a constantly moving area called the interface region, in better detail than has ever been done before. During its first year in space, IRIS provided detailed spectra and images of this area, finding even more turbulence and complexity than expected and has met mission success. For more, see: http://www.nasa.gov/iris

- The Magnetospheric Multiscale (MMS) mission completed all observatory environmental testing. MMS is comprised of four identically instrumented spacecraft that will use Earth's magnetosphere as a laboratory to study how the Sun's and Earth's magnetic fields connect and disconnect, explosively transferring energy from one to the other—a process that occurs throughout the universe, known as magnetic reconnection. For more, see: http://www.nasa.gov/mms

- The NASA instruments (Heavy Ion Sensor and Heliospheric Imager) for Solar Orbiter successfully completed Critical Design Reviews (CDR). Solar Orbiter is an ESA/NASA collaborative mission that will characterize the Sun's polar regions and equatorial atmosphere and explore how fundamental plasma physical processes operate near the Sun. For more, see: http://sci.esa.int/solar-orbiter/

- Solar Probe Plus (SPP) successfully completed PDR and was confirmed to enter development. SPP will be the first mission to fly into the Sun's atmosphere, or corona, and will revolutionize our knowledge of the physics of the origin and evolution of the solar wind. For more, see: http://solarprobe.jhuapl.edu/

- The Voyager 1 spacecraft became the first human-made object to officially venture into interstellar space. The 36-year-old probe is about 12 billion miles (19 billion kilometers) from our Sun. Voyager is in a transitional region immediately outside the solar bubble, where some effects from our Sun are still evident. For more, see: http://www.nasa.gov/voyager

Strategic Objective 1.5: Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.

Planetary science is a grand human enterprise that seeks to understand the history of our solar system and the distribution of life within it. NASA is at the frontier of a journey of scientific discoveries that are yielding a profound new understanding of our solar system. Robotic exploration is the current approach to planetary science and is the necessary precursor to the expansion of humanity beyond Earth. Ground-based research and observations supplement our space-based assets. NASA's Planetary Science Division continues to expand our knowledge of the solar system, with active missions and Earth-based research programs exploring all the way from Mercury to Pluto and beyond.

MAVEN launched to and now orbiting Mars

The Mars Atmosphere and Volatile EvolutioN (MAVEN) mission, launched on November 18, 2013, and arrived at Mars on September 21, 2014. MAVEN is the first spacecraft

devoted to exploring and understanding the Martian upper atmosphere, ionosphere, and interactions with the Sun and solar wind. Scientists will use MAVEN data to explore the loss of volatile compounds (such as carbon dioxide, nitrogen, and water) from the Martian atmosphere to space. Understanding atmospheric loss will give scientists insight into the history of Mars' atmosphere and climate, liquid water, and planetary habitability. The arrival of MAVEN at Mars coincided with the arrival of comet Siding Spring, which passed within approximately 80,000 miles of Mars, depositing pristine material shed from its nucleus into the top of the Martian atmosphere. This particular comet has never before entered the inner solar system, so it will provide a fresh source of clues to our solar system's earliest days. MAVEN will study gases coming off the comet's nucleus into its coma as it is warmed by the Sun. MAVEN also will look for effects the comet flyby may have on the planet's upper atmosphere and observe the comet as it travels through the solar wind. For more information, see: http://www.nasa.gov/maven

Other key FY 2014 achievements include:

- The Mars Science Laboratory (MSL) completed its mission success criteria. The Curiosity rover is en route to the long-term science destinations on the lower slopes of Mount Sharp. This area begins approximately two miles (3 kilometers) southwest of the rover's current position. An outcrop of a base layer of the mountain, dubbed Pahrump Hills, lies much closer: less than one-third of a mile (500 meters) from Curiosity. For more, see: http://www.nasa.gov/msl

- The Lunar Atmosphere and Dust Environment Explorer (LADEE) completed its mission in April 2014. The highly successful mission inventoried and characterized the tenuous lunar exosphere and mapped the spatial and temporal distribution of the major contributors: helium, neon, argon, sodium, and potassium. These and other results are improving our understanding of how the Moon and other airless bodies interact with their environments. For more, see: http://www.nasa.gov/ladee

- The Origins Spectral Interpretation Resource Identification Security–Regolith Explorer (OSIRIS-REx) and Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSIGHT) (Discovery 12) missions completed their CDRs, enabling the projects to proceed with final design and fabrication. For more, see: http://www.nasa.gov/osiris-rex and http://www.nasa.gov/insight

Strategic Objective 1.6: Discover how the universe works, explore how it began and evolved, and search for life on planets around other stars.

NASA leads the Nation and the world on a continuing journey to answer some of the most profound questions that touch the hearts of all humanity: How does the universe work? How did we get here? Are we alone? The scope of astrophysics is truly breathtaking, ranging from the birth of the universe and the development of stars and galaxies over cosmic time, to the search for life on planets around other stars. Often in cooperation with ground-based observatories, NASA astrophysics missions exploit the full range of the electromagnetic spectrum and the physics of high-energy subatomic particles to understand the broad diversity of objects in the universe.

Image Caption: The United Launch Alliance Atlas V rocket with the MAVEN spacecraft launches from the Cape Canaveral Air Force Station Space Launch Complex 41, Monday, Nov. 18, 2013, Cape Canaveral, Florida. (Credit: NASA/Bill Ingalls)

James Webb Space Telescope (JWST) Makes Progress Throughout FY 2014

JWST continues to make progress toward meeting its planned launch date of October 2018. As of July 2014, the telescope's four science instruments have been fully integrated into the Integrated Science Instrument Module (ISIM) and are undergoing their major cryogenic-vacuum testing. The prototype telescope support structure has arrived at Goddard Space Flight Center to practice placing mirror segments on it in preparation for assembling the flight telescope support structure and mirrors in 2015; and preparation of the Johnson Space Center's Chamber A for next year's tests is going very well. In FY 2014, the project continued to address challenges relating to the schedule for the ultracold refrigeration unit (or cryo-cooler) required for the Mid-Infrared Instrument (MIRI). The project is well poised for its 2015 major activity: assembly of the mirror.

JWST, a large infrared telescope with a 6.5-meter primary mirror, will be the premier observatory of the next decade, serving thousands of astronomers worldwide. It will study every phase in the history of our universe, ranging from the first luminous glows after the Big Bang, to the formation of solar systems capable of supporting life on planets like Earth, to the evolution of our own Solar System. For more information, see: http://www.nasa.gov/jwst

Image Caption: The JWST flight backplane center section and backplane support fixture on a rollover fixture at Northrop Grumman. The hardware pictured here has passed its acceptance testing and is being readied for attaching the primary mirror wings and secondary mirror support struts. (Credit: Northrop Grumman Aerospace Systems)

Other FY 2014 achievements include:

- The Kepler mission discovers planets orbiting other stars, called exoplanets, and is specifically designed to discover Earth-size and smaller planets. In February 2014, the Kepler team announced the confirmation of more than 700 new exoplanets, at once tripling the number of confirmed planets discovered by the mission and increasing the number of known exoplanets to nearly 1,700. In addition, in April the team announced the discovery of Kepler-186f, the first truly Earth-sized planet in the habitable zone of a star other than the Sun For more, see: http://www.nasa.gov/kepler
- The Stratospheric Observatory for Infrared Astronomy (SOFIA) achieved Full Operational Capability (FOC) in February 2014, began Cycle 2 science operations, and formally entered Operational Phase in May 2014. For more, see: http://www.nasa.gov/sofia
- The Nuclear Spectroscopic Telescope Array (NuSTAR), a Small Explorer (SMEX) mission, successfully completed its two year prime mission in July 2014 and entered a two year extension period. In its prime mission, NuSTAR made the most robust measurements yet of the mind-bending spin rate of black holes and provided new insight into how massive stars slosh around before exploding.

For more, see:
http://www.nasa.gov/mission_pages/nustar/main

- The Neutron star Interior Composition ExploreR (NICER) mission was confirmed in February 2014. The NICER X-ray timing and spectroscopy instrument will be an attached payload aboard the ISS and will be dedicated to the study of the extraordinary gravitational, electromagnetic, and nuclear-physics environments embodied by neutron stars. It is on track for a 2016 launch. For more, see:
http://heasarc.gsfc.nasa.gov/docs/nicer/

- NASA delivered the ASTRO-H Soft X-ray Spectrometer (SXS) calorimeter spectrometer insert to the Japan Aerospace Exploration Agency (JAXA) in March 2014. SXS, with its unprecedented sensitivity for high-resolution x-ray spectroscopy, will perform a wide variety of breakthrough science investigations directly aligned with NASA goals. For more, see:
http://heasarc.gsfc.nasa.gov/docs/astroh/

Strategic Objective 1.7: Transform NASA missions and advance the Nation's capabilities by maturing crosscutting and innovative space technologies.

For decades, NASA investment in space technology has helped make the United States the global leader in space exploration and scientific discovery, while significantly contributing to the technology-based U.S. economy. NASA continues that legacy today, through its Space Technology Mission Directorate (STMD), with a balanced portfolio of technology development across a broad range of technical areas and at various stages of technical maturity. STMD invests in pioneering concepts that spur innovation across NASA and the aerospace enterprise. These transformative and crosscutting technology breakthroughs enable more challenging missions, incubate new ideas and markets that strengthen the economy, and contribute to U.S. technological global leadership.

NASA Successfully Tests the Low-Density Supersonic Decelerator (LDSD)

During FY 2014, NASA successfully completed its first test of the Low-Density Supersonic Decelerator (LDSD) as part of the Agency's development and evaluation of new landing technologies for future Mars missions. The near-space test flight occurred off the coast of the U.S. Navy's Pacific Missile Range Facility in Kauai, Hawaii on June 28, 2014, the first of three planned for the LDSD project. Later that day, recovery operations retrieved the test vehicle hardware, black box data recorder, and parachute.

The LDSD team was thrilled with this first near-space test flight, having met all flight objectives (i.e., the team launched the test vehicle to target altitude, conducted a powered flight, collected real-time telemetry, and recovered the balloon envelope). In addition, NASA deployed two new landing technologies during the test. The Supersonic Inflatable Aerodynamic Decelerator (SIAD), a large doughnut-shaped deceleration technology, deployed first during the flight and was a phenomenal success. The second deployment was that of an enormous parachute (i.e., the Supersonic Disk Sail Parachute). Imagery downlinked in real-time from the test vehicle indicated that the parachute did not deploy as expected, and the team is still analyzing data on the parachute so that lessons learned can be applied for fu-

ture test flights. The next two flights include official tests of these landing technologies, involving identical saucer-shaped vehicles.

In order to get larger payloads to Mars and to pave the way for future human explorers, cutting-edge technologies like LDSD are critical. Among other applications, this new space technology will enable delivery of the supplies and materials needed for long-duration missions to the Red Planet. The next LDSD flight test is currently planned for FY 2015.

Other key FY 2014 achievements include:

- Completed major milestones for other Technology Demonstration Missions (TDM) projects, including Deep Space Atomic Clock (DSAC) and Composites for Exploration Upper Stage.

- Game Changing Development (GCD) completed pressure testing of a 5.5m Composite Cryogenic Tank; delivered operational legs for Robonaut2 to the ISS, on-board a SpaceX launch; and completed three Synchronized Position Hold, Engage, Reorient, Experimental Satellites (SPHERES)-Slosh experiments on the ISS.

- Small Spacecraft Technologies (SST) successfully flew PhoneSat 2.4 and 2.5. On separate flights, these smart-phone-based CubeSats tested two-way radio capabilities and an orientation-control system.

- Flight Opportunities (FO) flew technology payloads using flight services from four providers: Zero-G, UP Aerospace, Masten, and Near Space.

- Small Business Innovative Research (SBIR)/Small Business Technology Transfer (STTR) continues to execute Phase II-Enhancement contract options, extending R&D with funding partners, and has initiated “Commercial Readiness” projects to create direct infusion potential for SBIR/STTR-developed technology.

- Selected new early stage innovation investments, including the 2014 class of

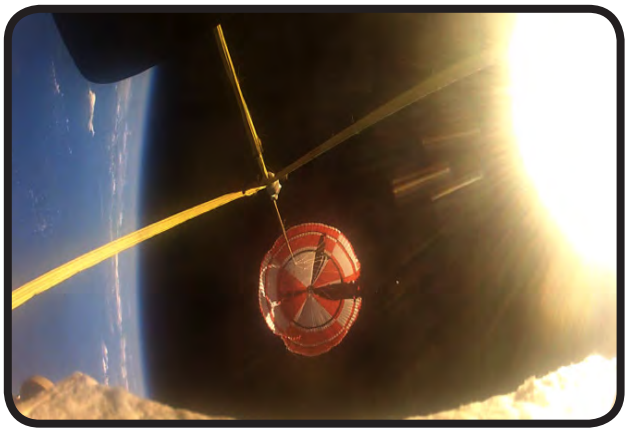


Image Caption: The first LDSD near-space test flight: The Supersonic Inflatable Aerodynamic Decelerator [SIAD] deploys (left); Parachute deployment provides data for lessons learned that can be applied to the next test flights (right). (Credit: NASA/JPL-Caltech)

NASA Space Technology Research Fellows, seven Early Career Faculty Space Tech Research Grants, 12 Phase I NASA Innovative Advanced Concepts (NIAC) projects, five Phase II NIAC projects, and Center Innovation Fund (CIF) projects across all ten NASA Centers.

Strategic Goal 2:
Advance understanding of Earth and develop technologies to improve the quality of life on our home planet.

NASA's accomplishments advance the understanding of Earth and help to improve life for its inhabitants, whether developing new aircraft technologies for safer, more efficient air travel, uncovering the complexities of Earth's natural systems, or transferring technologies to the commercial marketplace. This goal includes NASA's objectives for aeronautics research, Earth science, technology portfolio optimization, and STEM education.

Strategic Objective 2.1: Enable a revolutionary transformation for safe and sustainable U.S. and global aviation by advancing aeronautics research.

The Aeronautics Research Mission Directorate (ARMD) contributes unique innovations to aviation through research activities, which help sustain and advance the U.S. civil aviation industry. The results of these activities will enable a revolutionary transformation of the aviation system to improve our quality of life and productivity on Earth.

ARMD established a new strategic vision in the FY 2014 NASA Strategic Plan, identifying six new strategic research thrusts: safe, efficient growth in global operations; innovation in commercial supersonic aircraft; ultra-efficient commercial vehicles; transition to low-carbon propulsion; real-time, system-wide safety assurance; and assured autonomy for aviation transformation. During FY 2014, ARMD undertook significant planning for the reorganization of its research programs to align with the new strategic thrusts.

Image Caption: NASA's DC-8 research aircraft, burning biofuel as part of the ACCESS II experiment conducted with Canadian and German research partners, leads one of the "sampling" chase aircraft across an early morning sky near NASA's Armstrong Aircraft Operations Facility in Palmdale, California. (Credit: NASA/ORAU Richard Moore)

NASA Conducts Alternative Jet Fuel Flight Tests with International Partners

Conducted in May 2014 over Palmdale, California, Alternative Fuel Effects on Contrails and Cruise Emissions II (ACCESS II) flight testing is the latest in a series of ground and flight tests that began in 2009 to study emissions and contrail formation from new blends of aviation fuels that include biofuel from renewable sources. The ACCESS II experiment gathered additional data, confirming the results of ACCESS I. This testing also gathered information used to aid in developing theories about contrail formation. Understanding the impacts of alternative fuel use in aviation could enable widespread use of one or more substitutes to fossil fuels, as these new fuels become more readily available and cost competitive with conventional jet fuels. This research supports ARMD's strategic vision, part of which is to enable the transition of the aviation industry to alternative fuels and low-carbon propulsion systems. For more information, see: http://www.nasa.gov/aero/access-ii-confirms-jet-biofuel-burns-cleaner/index.html

NASA Delivers New Air Traffic Spacing Tool to FAA

The Airspace Systems Program continued progress toward Air Traffic Management Technology Demonstration-1 (ATD-1), which will showcase an integrated set of technologies that provide an efficient arrival solution for managing an aircraft's descent from cruising altitude all the way down to the runway. One of the ATD-1 tools, Terminal Sequencing and Spacing (TSS), was officially transferred to the FAA during a July 2014 ceremony. TSS technology provides information to controllers about the speeds they should assign to aircraft as they follow more fuel-efficient, continuous-descent approaches into airports, saving both time and fuel and reducing emissions. TSS is another step in NASA's support of the development of a Next Generation Air Transportation System (NextGen), which is a joint multi-agency and industry initiative to modernize and upgrade the nation's air traffic control system. For more information, see: http://www.nasa.gov/aero/nasa-delivers-traffic-spacing-tools-tss/

Other key FY 2014 achievements include:

- Demonstrated an aerodynamic model enabling stall recovery training for commercial airline pilots. This surpasses the capabilities of current day simulators. Simulation of large transport airplanes in upset conditions remains a topic of high interest to commercial aviation, as part of the effort to reduce the risk of fatal loss-of-control accidents.

- Completed Low Boom Flight Demonstrator Conceptual Design studies. This is a key step toward demonstrating the design tools and the feasibility of low-boom supersonic vehicles.

- Completed high-fidelity experimental and computer simulations to determine the potential benefit of the truss-braced wing technology concept. This concept is a promising technology for designing lighter-weight, lower-drag wings that would enable reduced fuel use in transport aircraft.

- Modeled and designed a low alternating current-loss, fully superconducting electric generator to be used in a distributed propulsion aircraft configuration. This is a concept that would allow multiple electric motors to drive many distributed fans for use in an ultra-efficient hybrid electric aircraft.

- Completed demonstration of a wireless sensor providing lightning protection. It also can detect and diagnose damage in composite structures, using unique electrical signatures related to amplitude, frequency, bandwidth, and phase.

- Conducted a human-in-the-loop simulation where unmanned aircraft were mixed with piloted aircraft and subjected to a range of test conditions. This was the first in an integrated, continual flight test campaign planned over three years through FY 2016. Subsequent testing of the Unmanned Aircraft Systems will demonstrate increased complexity in the testing environment.

Strategic Objective 2.2: Advance knowledge of Earth as a system to meet the challenges of environmental change, and to improve life on our planet.

NASA's Earth Science programs shape an interdisciplinary view of Earth, exploring the interaction among the atmosphere, oceans, ice sheets, land surface interior, and life itself, which enables scientists to measure global and climate changes and to inform decisions by Government, organizations, and people. NASA's global observations provide a unique vantage point from which to study and gain understanding of changes in our planet. Since the Agency's inception in 1958, NASA has established itself as a world leader in Earth science and climate studies.

NASA does more than develop and build Earth-observing spacecraft and sensors. The Agency's multi-disciplinary team of scientists, engineers, and computer modelers also analyze vast archives of data for insights into Earth's interconnected systems -- atmosphere, ocean, ice, land, biosphere -- and openly provide that data to the global community. NASA designs and deploys airborne, ground-based and ocean-going field campaigns that complement, enhance, and improve space-based observational capabilities. Also, NASA works with other Government agencies and partner organizations to apply NASA data and computer models to improve decision-making and

solve problems.

Successful Launches of GPM and OCO-2

The Global Precipitation Measurement (GPM) Core Observatory launched on February 27, 2014 from Tanegashima Space Center, Japan. The launch of this mission inaugurates an unprecedented international satellite constellation to produce frequent global observations of rainfall and snowfall – revolutionary new data that will help answer questions about our planet's life-sustaining water cycle and improve weather forecasting and water resource management. NASA and JAXA developed GPM as a global successor to the Tropical Rainfall Measuring Mission (TRMM).

Through improved measurements of precipitation globally, the GPM mission will help to advance our understanding of Earth's water and energy cycle, improve forecasting of extreme events that cause natural hazards and disasters, and extend current capabilities in using accurate and timely information about precipitation to directly benefit society. GPM's initial on-orbit operations are going extremely well.

Image Caption: The GPM mission is an international constellation of satellites that provides next-generation observations of global precipitation approximately every three hours. The highly detailed data provided by the GPM Core Observatory, shown in the foreground, unifies and advances precipitation measurements made by other satellites in the constellation. (Credit: NASA)

On July 2, 2014, the successful launch of the Orbiting Carbon Observatory-2 (OCO-2) from Vandenberg Air Force Base followed the successful launch of the GPM Core Observatory. As carbon dioxide levels in Earth's atmosphere continue to rise, OCO-2 will make a completely new set of global, satellite measurements of the still mysterious ways that carbon moves through the atmosphere, land, and ocean. OCO-2 took its position at the lead of NASA's polar-orbiting A-Train constellation of Earth-observing satellites on August 3, as planned.

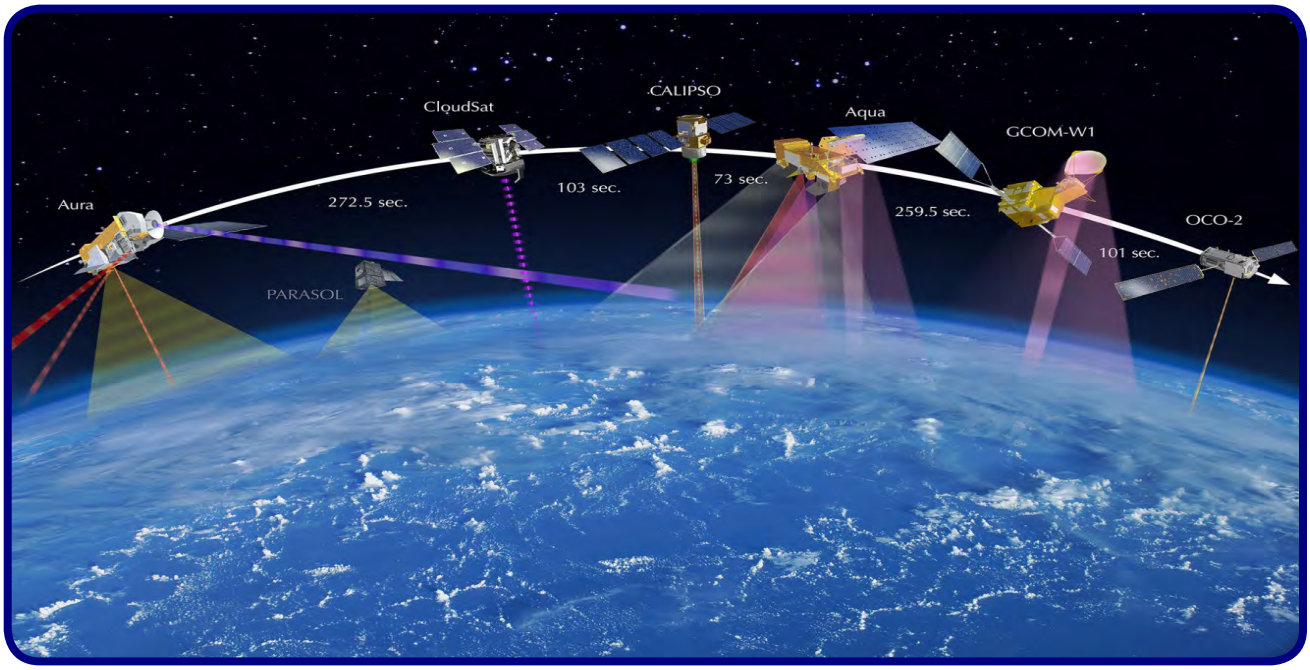


Image Caption: In August, OCO-2 took its position at the lead of NASA's polar-orbiting Afternoon (A-Train) Constellation of Earth-observing satellites, which currently includes GCOM-W1 (a JAXA spacecraft), Aqua, CALIPSO, CloudSat, and Aura. The instruments on these precisely engineered satellites make almost simultaneous measurements of clouds, aerosols, atmospheric chemistry, and other elements critical to understanding Earth's changing climate. (Credit: NASA)

Other key FY 2014 achievements include:

- Completed PDRs and confirmed both the Cyclone Global Navigation Satellite System (CYGNSS/EV-2) and Gravity Recovery and Climate Experiment (GRACE) Follow-On mission.

- Completed the Instrument Thermal Vacuum Test for the Soil Moisture Active Passive (SMAP) mission in June 2014.

- The Third National Climate Assessment (NCA) report, a product of the U.S. Global Change Research Program (USGCRP), was released in May 2014. The NCA is a quadrennial report, mandated under the Global Change Research Act of 1990, which summarizes the science of climate change, analyzes the impacts on regions and sectors within the United States, and projects changes through the end of the century. As a key USGCRP agency, NASA played a major role in the Third NCA report. NASA science underpinned numerous aspects of the report and was featured in numerous report chapters. For more information, see: http://nca2014.globalchange.gov/

- The NASA Carbon Monitoring System (CMS) project uses satellite and airborne remote sensing capabilities to prototype key data products for carbon monitoring, reporting, and verification. Accomplishments to date include the development of a continental U.S. biomass data product and a global carbon flux product; demonstrations of remote sensing-based carbon monitoring capabilities in support of local- and regional-scale carbon management projects; scoping of potential new ocean carbon monitoring products; and engagement of carbon monitoring

stakeholders to better understand their needs for carbon data and information products. The CMS project has developed one of the most advanced carbon data assimilation systems in the world that integrates satellite and surface observations related to anthropogenic, oceanic, terrestrial, and atmospheric carbon.

- Working closely with the Environmental Protection Agency (EPA), researchers on a NASA Applied Sciences project incorporated Moderate Resolution Imaging Spectroradiometer (MODIS) aerosol optical depth (AOD) measurements into the EPA's AirNow air quality alert system. The new hybrid system uses satellite AOD measurements to fill in the gaps in the ground-level monitoring network, providing coverage to 18 million more people than the original ground based system.

- The CubeSAT On-board processing Validation Experiment (COVE) launched aboard the Michigan Multipurpose Minisatellite (MCubed) cubesat in December 2013. MCubed/COVE-2 is validating on-board data processing technology in space. This technology could greatly reduce the science data transmission rate required for on-orbit operations.

Strategic Objective 2.3: Optimize Agency technology investments, foster open innovation, and facilitate technology infusion, ensuring the greatest National benefit.

NASA's Office of the Chief Technologist (OCT) enables critical technology development and open innovation, optimizes NASA's technology portfolio, and maximizes the transfer of NASA technology to U.S. partners. This work is performed under the Partnership Development and Strategic Integration program.

NASA Launches Technology Transfer 'Super Tool'

NASA developed an extensive intellectual property portfolio of innovative technologies in its conduct of taxpayer-funded space and aeronautics missions. OCT works diligently to ensure transfer and commercial application of these technologies in order to create new markets, new jobs, to enhance the quality of life on Earth, and to bolster the American economy. To that end, NASA piloted its Quick Launch Licensing project to provide an innovative approach to technology transfer. See: https://quicklaunch.ndc.nasa.gov

Under Quick Launch, obtaining licenses is easy, quick, and inexpensive. There is a greatly simplified license application and license agreement process developed by OCT in collaboration with the Headquarters Office of the General Counsel. Licenses offered are non-exclusive and feature modest, pre-established, upfront licensing fees and fixed annual royalty payments, as well as a pre-determined licensed field of use.

The project went live in November 2013 as a "proof-of-concept" approach, initially focusing on technologies that had not generated commercial interest, had lower Technology Readiness Levels, lacked ongoing Principle Investigator support, and/or had significant upcoming maintenance fees. Now that the idea has taken hold and initial interest is encouraging, Quick Launch expansion plans include licenses of greater commercial value offered at higher, but still established, initial and annual royalty terms.

Other key FY 2014 achievements include:

- NASA continued to track and analyze technology investments in TechPort, a Web-based software system that serves as NASA's integrated technology data source and decision support tool. In FY 2014, NASA enhanced TechPort by improving usability, increasing system operation speed, improving security, and configuring the system for public release. NASA completed all major milestones to enable public release in FY 2015.

- NASA is reaching new audiences for licensing opportunities and using crowdsourcing to help find secondary applications for NASA technologies. OCT engaged with a start-up company called Marblar to enable crowdsourcing of new ideas and products using NASA technologies. NASA received 25 market summaries and one license.

- The Asteroid Grand Challenge announced several new partnerships, including Space Act Agreements with Planetary Resources, SpaceGAMBIT, Maui Makers, and Slooh. Other accomplishments for the Asteroid Grand Challenge are available at : http://www.nasa.gov/content/asteroid-grand-challenge-first-anniversary/

- In April 2014, a new software catalog made available NASA-developed code for public use. With over 1,000 codes organized into 15 broad subject matter categories, this catalog offers a large portfolio of software products for a wide variety of applications. NASA code is available at no cost. More information is available at: http://www.nasa.gov/content/new-catalog-brings-nasa-software-down-to-earth/

Strategic Objective 2.4: Advance the Nation's Science, Technology, Engineering, and Math (STEM) education and workforce pipeline by working collaboratively with other agencies to engage students, teachers and faculty in NASA's missions and unique assets.

NASA's education programs work in collaboration with other Federal agencies to improve the quality of science, technology, engineering, and math (STEM) education in the United States, which supports both NASA's strategic plan and the Administration's STEM policy. To maintain a globally competitive Nation, our education programs develop and deliver activities that support the growth of NASA's and the Nation's STEM workforce, help develop STEM educators, engage and establish partnerships with institutions, and inspire and educate the public.

Image Caption: After final inspection by KSC lab safety, members of the UR-1 Team turn the experiment over to KSC for loading into the SpaceX-3 Dragon spacecraft. The experiment was launched to the ISS in April 2014. (Credit: NASA)

Ground-Based to Flight-Based Research with University Research-1 (UR-1)

In FY 2014, a collaborative mission through NASA's ISS Program, five universities, and the NanoRacks commercial platform advanced ground-based student cancer research to flight-based research aboard the ISS entitled, University Research-1 (UR-1). The ground-based research, "The Investigation of Countermeasures to Modulate and Augment System," was initially funded through the NASA Minority University Research and Education Project (MUREP). MUREP enhances the research, academic, and technology capabilities of Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities, Asian American and Native American Pacific Islander-Serving Institutions, and other Minority Serving Institutions (MSIs) through multiyear grants awarded to MSIs.

The ground-based research was converted to flight-based research yielding UR-1 results focused on cancer cells and the effects of space radiation on the immune system. The research addressed critical risks to the health of the astronauts and humankind. The team of professors, students, and NASA scientists traveled to KSC to watch the successful launch of their experiment to the ISS in April 2014. The five UR-1 participating universities are Texas Southern University, Prairie View A&M University, Tougaloo College, Jarvis Christian College, and Savannah State University. Additional information concerning this research can be found at: http://www.nasa.gov/mission_pages/station/research/experiments/1246.html.

Other key FY 2014 achievements include:

- NASA and the Department of Education partnered on several activities. In July 2013, the two agencies signed a Space Act Agreement to launch a collaborative pilot education initiative to infuse NASA content into the Department of Education's 21st Century Community Learning Centers, providing academic enrichment opportunities during non-school hours or expanded learning time for students and their families, particularly students who attend schools in under-resourced communities

- NASA participated in several Committee on STEM Education Interagency Working Groups, which facilitated increased communication and collaboration among Federal agencies with regard to STEM education.

- The seventh annual RockOn! Workshop provided 61 community college and university students and instructors the opportunity to learn how to build a scientific payload for suborbital rocket flight and experience what it means to be a rocket scientist. It took place at NASA's Wallops Flight Facility from June 21-26, 2014 as part of "Rocket Week."

Strategic Goal 3:
Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure.

NASA's Mission requires dedicated, knowledgeable people and cutting-edge facilities and capabilities to provide the tools and support necessary to carry out our ambitious tasks. The programs under Strategic Goal 3 support all of NASA's space-, air-, and Earth-based research and innovation activities, producing the best return on the Nation's investment. This goal includes NA-

SA's objectives for Mission Support, technical capabilities, information technology (IT) services, and Safety and Mission Success.

Strategic Objective 3.1: Attract and advance a highly skilled, competent, and diverse workforce, cultivate an innovative work environment, and provide the facilities, tools, and services needed to conduct NASA's missions.

NASA's workforce and institutional capabilities enable us to successfully conduct our missions. Programs aligned with Strategic Objective 3.1 ensure effective management of human capital, finance, information technology, infrastructure, acquisitions, security, real and personal property, occupational health and safety, equal employment opportunity and diversity, small business programs, external relations, internal and external communications, stakeholder engagement, and other essential corporate functions.

NASA named the Best Place to Work in the Federal Government for Second Year

NASA's most powerful asset for achieving mission success is a multidisciplinary team of diverse, competent people across all of NASA. For the second consecutive year, NASA was voted the Best Place to Work in the Federal Government, according to the Partnership for Public Service. Based on 2012 Employee Viewpoint Survey (EVS) results, this survey also named NASA the top-ranked large agency on innovation. These results are a testament to the excellence of our workforce and their determination to maintain America's leadership in space exploration.

Diversity and Inclusion Progress

As a key component of NASA's 2014 Strategic Plan is attracting and advancing a highly-skilled and diverse workforce, in FY 2014 NASA launched its second Diversity & Inclusion (D&I) Survey of the workforce. NASA seeks to harness the benefits of diversity and inclusion and infuse the NASA workforce with the spirit of innovation. The results of the 2014 D&I Survey show that NASA employees, by an overwhelming margin, believe that NASA promotes fair treatment of employees, regardless of their different diversity characteristics, and understand that having employees with diverse backgrounds is a business advantage for NASA. Overall, it appears a continued emphasis on D&I is helping to maintain NASA's position as a leading employer of choice among government agencies.

NASA continues focus on sustainability

Providing sustainable facilities and tools are essential to providing the work environment and services needed to effectively conduct NASA's missions. In FY 2014, NASA continued its focus on sustainability, with six buildings certified as sustainable per the U.S. Green Building Council LEED Rating system. The Armstrong Flight Research Center's Facilities Support Center achieved a Platinum certification in June. NASA's inventory of sustainable facilities now exceeds 2.3 million square feet. NASA also surpassed two of the primary energy conservation and green energy metrics of the Energy Independence and Security Act of 2007, reducing energy intensity by 26.4 percent and increasing our use of renewable energy Agency wide to 7.6 percent.

Image Caption: NASA Armstrong's new Facilities Support Center has been certified that it met the Leadership in Energy and Environmental Design (LEED) new construction platinum standard for environment and energy efficiency. The entire 38,000-square-foot structure is lit by light-emitting diode fixtures, which consume only a tiny fraction of the electricity used by conventional florescent lights. (Credit: NASA/Tom Tschida)

Other key achievements in FY 2014 include:

- NASA finalized the Environmental Impact Statement for the cleanup and demolition of Santa Susana Field Laboratory, which is the first step in aiding NASA to divest itself of facilities that no longer meet mission needs.
- NASA continues to make progress in the reduction of transaction costs and the management of high risk contract actions. The number of new Cost Plus Award Fee Contracts, delivery/task order and non-competed actions are all down measurably for the same period in FY 2013.
- NASA has exceeded OMB's Sustainability Goals for Fleet Management. NASA successfully reduced Agency Vehicles by 137 for a cost savings of $499K. NASA has also reduced Agency Petroleum Usage and increased Alternative Fuel Usage exceeding the OMB metrics for both.

Strategic Objective 3.2: Ensure the availability and continued advance of strategic technical programmatic capabilities to sustain NASA's Mission.

NASA's technical capabilities and assets support NASA missions, as well as the work of others outside of the Agency. The programs under this Objective ensure that our key capabilities and critical assets will be available in the future to support the missions that require them, such as launch services to NASA and civil sector missions, as well as an uninterrupted, reliable space communications network to allow data transmissions to Earth from space.

New Satellites in the TDRS Constellation

The Tracking and Data Relay Satellite (TDRS) Constellation provides critical communications services to a diverse fleet of spacecraft. These satellites will ensure the Space Network's continuation of around-the-clock, high throughput communications services to NASA's missions; serving the scientific community and human spaceflight program for many years to come. To sustain this critical capability, the eleventh TDRS spacecraft (TDRS-K), which was launched in 2013, was accepted and approved for operations. The twelfth TDRS spacecraft (TDRS-L) was launched in January 2014 and has been accepted for operations.

Image Caption: Members of the news media are given an opportunity for an up-close look at the TDRS-L spacecraft undergoing preflight processing inside the Astrotech payload processing facility in Titusville on January 3, 2014. (Credit: NASA/Dimitri Gerondidakis)

Other key FY 2014 achievements include:

- The Launch Services program achieved a 100 percent success rate in FY 2014 with the successful launch of three NASA missions, putting over $800 million worth of spacecraft into orbit to provide operational communications data and enabling first-ever science with the launch of MAVEN, TDRS-L, and OCO-2.

- The Rocket Propulsion Test (RPT) program performed 313 tests for 272,393 seconds, while maintaining 100 percent of availability. RPT's customers included the SLS program to test the J-2X engine (a candidate engine for the SLS second stage), the U.S. Air Force for RS-68 engine testing, and numerous commercial partners, such as Orbital, SpaceX, MDA, and Boeing. Major renovations to the B-2 test stand at SSC are also underway in preparation for SLS core stage testing.

- The Lunar Laser Communications Demonstration (LLCD) on the LADEE spacecraft demonstrated communications via laser from the Moon to the Earth at 622 megabits per second (Mbps) in October of 2013. This accomplishment demonstrated the possibilities of laser communications technology, with four times the data return of conventional radio communications from the Moon, and was recognized with an R&D 100 Award from *R&D Magazine*, a Breakthrough Award from *Popular Mechanics*, and a nomination for the prestigious Collier Trophy.

- The Deep Space Network (DSN), which turned 50 years old on December 24, 2013, provides communication and tracking services to over 30 NASA and non-NASA missions in deep space. The first in a series of new 34 meter deep space beam waveguide antennas (DSS-35 in Canberra, Australia) achieved operational status in the fourth quarter of FY 2014. These new antennas will provide enhanced capacity to enable future missions.

Image caption: NASA's newest Deep Space Station (DSS-35) in Canberra, Australia. (Credit: NASA/Miguel Marina)

Image Caption: J-2X Engine No. 10002 was test fired on April 17, 2013, at Stennis Space Center. The J-2X is designed to power the second stage of the 130-metric ton heavy-lift version of the Space Launch System (SLS). J-2X testing provided valuable data and experience for the team developing the RS-25 engine, which will power the core stage of NASA's new SLS. (Credit: NASA)

Strategic Objective 3.3: Provide secure, effective, and affordable information technologies and services that enable NASA's Mission.

Information technology (IT) is a critical component of NASA's infrastructure to enable mission success. The Agency IT Services (AITS) program provides the policy and management for NASA's enterprise IT services including end user services, business applications, network management, computing platforms and data centers, and web services for the Agency's websites. IT security is a crucial element within the delivery of these services to ensure the confidentiality, integrity, and availability of NASA's information assets. The AITS program provides innovative IT solutions to assist NASA's scientists, engineers, and analysts with cost-effectively achieving their mission. The program also improves citizen access to NASA's scientific and technical information and increases citizen participation in NASA's diverse activities.

Leveraging the Cloud to Reduce Operational Costs

The Web Services program's ongoing transition of NASA's Web applications to a centralized cloud platform is reducing Operations and Maintenance (O&M) costs. NASA has migrated 158 Web applications into the production cloud environment managed by our WESTPrime contract. Following these migrations, NASA's focus shifted to the consolidation and decommissioning of applications and websites when practical to reduce costs. NASA decommissioned 45 applications that were no longer relevant for their programs or were consolidated into other existing websites and applications. These efforts led to a $3M decrease in O&M costs as compared to the prior year. Furthermore, the migration of NASA Headquarters' applications to the centralized environment reduced the Headquarters' data center footprint by 60 percent.

Enhancements to NASA's Cybersecurity

NASA expanded the Web Application Security Program (WASP) in FY 2014 and implemented an automated scanning process to identify security vulnerabilities, prioritize criticality of vulnerabilities, and coordinate with Centers to mitigate the related issues. In addition to WASP, NASA has continued to conduct in-depth penetration testing at individual Centers. These penetration testing activities have driven corrective actions for 195 discovered vulnerabilities as of June 30, 2014. In support of OMB's Cross-Agency Priority (CAP) Goal for Cybersecurity, NASA achieved over 75 percent compliance for

strong authentication using Personal Identity Verification (PIV) authentication for Windows systems. The Agency also procured and deployed intrusion detection systems (IDS) on the NASA Mission and Research Networks.

Other key FY 2014 achievements include:

- NASA's International Space Apps Challenge is an annual mass collaboration over a 48-hour period in cities around the world. The Challenge utilizes openly available data, supplied through NASA's missions and technology, and the talent of global volunteers to advance space exploration and improve the quality of life on Earth. In this third-annual challenge, more than 8,000 volunteers in 95 cities and 46 countries participated in 40 challenges. In three years, nearly 2,000 solutions have resulted in crowd-sourced methods to monitor air, water, and urban pollution, track environmental mishaps, alert citizens of weather or health-related disasters, and track the stars. For more, see: https://2014.spaceappschallenge.org/

- In alignment with the 2014 NASA Strategic Plan, NASA published the 2014 Information Resources Management (IRM) Strategic Plan. The three IRM goals and underlying objectives focus our IT community on providing mission-enabling IT capabilities, risk-based cybersecurity, and a sustainable management approach to support NASA's diverse mission needs. For more, see: http://www.nasa.gov/offices/ocio/IRM_Plan.html

Image Caption: NASA's Security Operations Center (SOC) provides a coordinated operational and technical approach to ensuring the protection of the Agency's information assets. This year, NASA held the first Agency-wide incident response exercise that involved the NASA SOC and incident response teams across all NASA Centers. (Credit: NASA ARC/Charles J Guest)

Strategic Objective 3.4: Ensure effective management of NASA programs and operations to complete the mission safely and successfully.

Safety and mission success programs protect the health and safety of the NASA workforce and improve the likelihood that NASA's programs, projects, and operations will be completed safely and successfully. NASA's commitment to safety and mission success extends to the American public, our employees, our commercial partners, and our contractors. Safety and Mission Success activities are conducted by the Office of the Chief Engineer (OCE), Office of Safety and Mission Assurance (OSMA), and Office of the Chief Health and Medical Officer (OCH-

MO). NASA's Safety and Mission Success (SMS) program successfully implemented its strategic objective of enhancing mission success of NASA's programs, projects, and operations, while ensuring the safety and health of the public and the NASA workforce in FY 2014. SMS demonstrated this by:

- Zero fatalities or permanent disabling injuries to the public resulting from NASA activities.
- Maintaining a Total Case Rate and Lost Time Case Rate that exceeded the goals of the President's Protecting Our Workers and Ensuring Reemployment initiative.
- Reducing the non-mission failure damage to NASA assets.
- Ensuring 100 percent of Category 1 and 2 projects used Agency Safety and Mission Success policy, procedures and independent assessments focused on both technical and programmatic mission success; and
- Ensuring that 100 percent of the engineering and programmatic workforce had access to the standards and knowledge base needed to maintain and build their skills.

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Financial Performance

CFO Letter

November 14, 2014

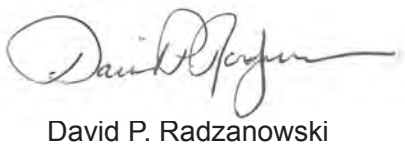
I am pleased to present the FY 2014 financial highlights and financial statements on behalf of the National Aeronautics and Space Administration (NASA). NASA is committed to the highest standards of financial accountability in support of the Nation's aeronautics and space missions, as demonstrated by this Agency Financial Report (AFR).

This AFR provides highlights of the Agency's efforts in FY 2014 to achieve the vision and goals set forth in the Strategic Plan and demonstrates the intersection between NASA's program and financial management. As the complexity and diversity of the mission portfolio has grown, the Agency's financial systems and processes have evolved to meet expanding information needs. Similar to the progress in our mission portfolios, NASA continues to make progress in the effectiveness of our financial management practices and systems.

As evidence that our efforts are having tangible results, I take great pride in reporting that for the fourth year in a row NASA received an unmodified "clean" opinion on our financial statements, with no material weaknesses or significant deficiencies. I am also pleased to report that NASA is in substantial compliance with the Federal Financial Management Improvement Act for FY 2014.

The Financial Highlights that immediately follow explain how NASA has used the funds entrusted to it to perform its mission and achieve the results described in this document's Performance section. In the Financial section, we provide our audited financial statements, accompanying notes and the independent auditor's opinion on our financial statements.

I am pleased with our achievements, and remain committed to ensuring sound financial management that delivers reliable and actionable information for both internal and external decision makers and stakeholders. I appreciate the continued support of the entire Agency, with special thanks to the Office of Inspector General. More detailed performance reporting will be available in our Annual Performance Report, to be released with the President's FY 2016 Budget in early 2015.



David P. Radzanowski
Chief Financial Officer

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Financial Highlights

This section provides highlights of NASA's financial performance for fiscal year (FY) 2014. The highlights explain the financial results of program and operational decisions. Key components of this section include:

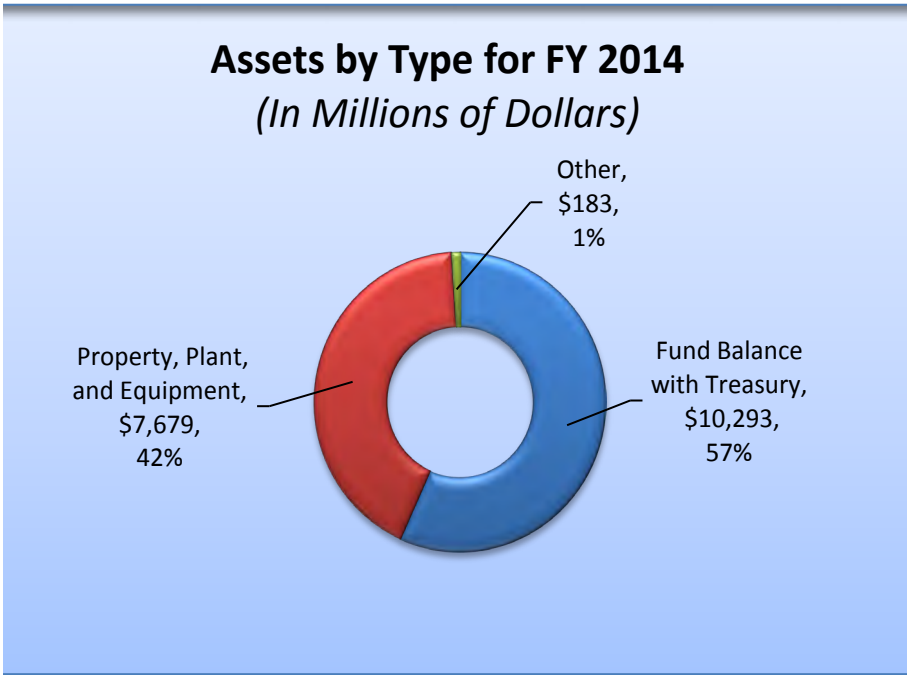
Overview of Financial Position:	Balance Sheet
Sources of Funding:	Statement of Budgetary Resources
Results of Operations:	Statement of Net Cost

Overview of Financial Position

NASA's Balance Sheet provides a snapshot of the Agency's financial position as of September 30, 2014. It displays amounts in three primary categories:

- Assets, which are the future economic benefits owned or available for use by NASA;
- Liabilities, which are amounts owed by NASA but not yet paid; and
- Net Position, which is comparable to net worth for private sector organizations.

Balance Sheet Categories *(In Millions of Dollars)*	2014	2013	Percent Change
Total Assets	**$ 18,155**	**$ 18,207**	**0**
Fund Balance with Treasury	10,293	9,771	5
Property Plant and Equipment	7,679	8,261	(7)
Other	183	175	5
Total Liabilities	**$ 4,560**	**$ 4,275**	**7**
Other Liabilites	1,673	1,578	6
Accounts Payable	1,565	1,403	12
Environmental and Disposal Liabilities	1,274	1,243	2
Federal Employee and Veteran Benefits	48	51	(6)
Total Net Position	**$ 13,595**	**$ 13,932**	**(2)**
Unexpended Appropriations	7,413	7,113	4
Cumulative Results of Operations	6,182	6,819	(9)

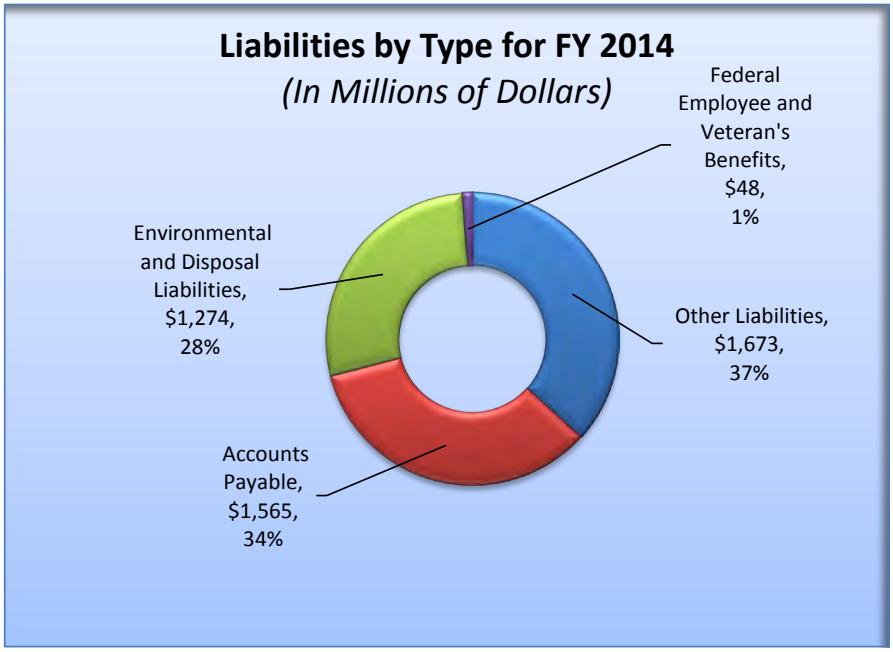


Assets were the largest of the three categories (Liabilities plus Net Position will always equal Total Assets). NASA's asset balance at the end of FY 2014 was $18.2 billion.

The Agency's Fund Balance with Treasury (FBWT) and its Property, Plant and Equipment (PP&E) were the two primary components of the total asset balance.

FBWT, which represents NASA's cash balance with the U.S. Department of the Treasury, was the largest asset at $10.3 billion, or 57 percent of total assets. This cash balance included Congressional appropriation funds available for NASA mission work (e.g. employee labor or purchased goods or services from contractors) that have not yet been paid.

NASA's PP&E had a net book value of almost $8 billion in FY 2014, which was 7 percent lower than in FY 2013. The decrease was driven by FY 2014 depreciation of $977 million for the International Space Station (ISS). The ISS, which was completed in 2011 and has a total acquisition cost as of September 30, 2014 of $10.4 billion, is NASA's single largest asset. Excluding ISS depreciation, NASA PP&E increased by $396 million in FY 2014 as the Agency continues to invest in the facilities and institutional equipment necessary to support NASA's exploration mission.



Liabilities for FY 2014 were $4.6 billion. Accounts Payable and Other Liabilities represent the majority of NASA's liabilities. NASA contracts with the private sector for many of the products and services that are used to execute NASA missions. NASA's Accounts Payable and Other Liabilities primarily represent NASA's unpaid payroll and private sector contractor costs incurred for goods and services to accomplish NASA mission requirements.

Other Liabilities, which primarily represents an estimate of accrued contractor, payroll and other costs incurred, that are not yet payable, was the Agency's single largest liability at $1.7 billion, or 37 percent of total liabilities. Other Liabilities increased by $95 million.

Accounts Payable, which represents the amount owed to other entities, was $1.6 billion at the end of the FY 2014, an increase of $162 million.

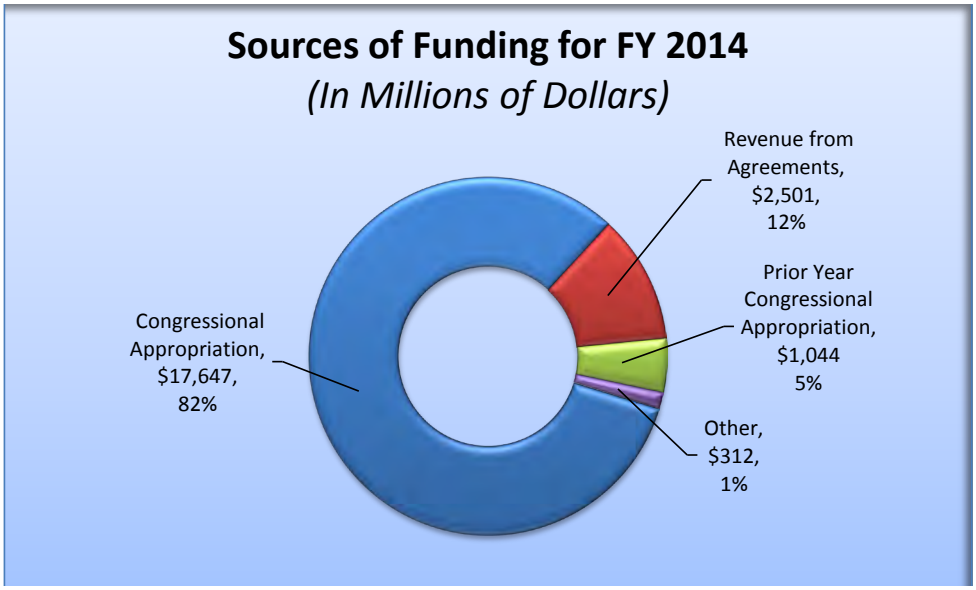
Environmental and Disposal Liabilities at $1.3 billion represents the estimated cost to cleanup both known and projected environmental hazards. The FY 2014 increase of $31 million was due primarily to increases in estimated cleanup costs for existing environmental restoration projects for all NASA locations and facilities.

Net Position, comprised of Unexpended Congressional Appropriations and Cumulative Results of Operations ("net worth"), decreased by $337 million, or 2 percent, from FY 2013. Cumulative Results of Operations, at $6.2 billion, were down by 9 percent from FY 2013 balances, due primarily to the decrease in PP&E. Unexpended Congressional Appropriations, at $7.4 billion, increased by 4 percent from FY 2013 balances. This was due primarily to an increase in unobligated balances that remain available for future use.

Sources of Funding

The Statement of Budgetary Resources provides information on the resources available to NASA. NASA's resources consist primarily of funds received from two sources:

- Appropriations from Congress for the current fiscal year and unobligated balances from prior fiscal years
- Revenue from agreements with other governmental organizations or private entities



In FY 2014, the total funds available for use by the Agency was $21.5 billion. NASA's total budget authority was $20.1 billion, comprised of both Congressional Appropriations (from current and prior fiscal years) and revenue earned from partnerships.

Appropriations from Congress for FY 2014, at $17.6 billion, comprised 82 percent of the funds available for use by the Agency. Congress designates the funding available to the Agency for a specific NASA mission or purpose. Appropriations that remained available from prior years comprised $1.0 billion, or 5 percent, of NASA's available resources in FY 2014.

NASA's funding also included $2.5 billion in FY 2014 for revenue from agreements with other governmental organizations or private entities. These earned revenues are received under NASA's authority to provide goods, services or use of facilities to other entities on a reimbursable basis.

Of the $21.5 billion funding available to NASA in FY 2014, NASA obligated $20.3 billion for programmatic and institutional use. An obligation results from an agreement that binds the Government to make an expenditure (or outlay) of funds, and reflects a reservation of budget authority that will be used to pay for a contract, labor, or other items. The remaining $1.2 billion has not yet been obligated.

Results of Operations

The Statement of Net Cost presents Net Cost of Operations by strategic goal and for NASA overall. NASA's strategic goals are described in the Mission Performance section of this Agency Financial Report. As discussed in this section, the Agency established new strategic goals for FY 2014. Prior year costs were reclassified for comparability. The Net Cost of Operations represents gross cost incurred less revenue earned for work performed for other government organizations or private entities. For FY 2014, NASA's gross cost was $20.3 billion. Earned revenue from other governmental organizations or private entities was $2.1 billion, or 11 percent of gross costs, leaving NASA with an FY 2014 net cost of $18.2 billion.

Gross Cost of Operations

NASA's day-to-day operations are performed at NASA and contractor offices and facilities around the globe and in space.

Gross Costs of Operations is presented in the following table, detailing select NASA programs that supported each strategic goal. Highlights of NASA program activities that contributed to FY 2014 gross costs are provided below for each strategic goal. A discussion of activities and costs that were reimbursed primarily by other governmental organizations or private entities (for example, earned revenue) is also provided.

Gross Cost by Strategic Goal *(In Millions of Dollars)*		2014		2013	Percent Change
Strategic Goal 1	**$**	**11,788**	**$**	**11,496**	**3**
International Space Station		2,921		2,853	2
Space Launch Systems		1,825		1,626	12
Multi-Purpose Crew Vehicle		1,041		1,120	(7)
Other NASA Programs		6,001		5,897	2
Strategic Goal 2	**$**	**3,646**	**$**	**3,663**	**0**
Earth Systematic Missions		590		684	(14)
Earth Science Research		420		429	(2)
Earth Science Multi-Mission		159		151	5
Other NASA Programs		2,477		2,399	3
Strategic Goal 3	**$**	**4,895**	**$**	**5,060**	**(3)**
Center Management and Operations		1,993		1,999	0
Space Communications and Navigation		566		528	7
Agency Management		385		369	4
Other NASA Programs		1,951		2,164	(10)
Total Gross Costs by Strategic Goal	**$**	**20,329**	**$**	**20,219**	**1**

Strategic Goal 1: Expand the frontiers of knowledge, capability, and opportunity in Space.

Gross costs for Strategic Goal 1 were $11.8 billion, an increase of $292 million, or 3 percent, over FY 2013 costs. The costs for this strategic goal represent 58 percent of total Agency gross cost. The three primary programs that support this goal (ISS, SLS, and the Orion MPCV) contributed over 50 percent of the cost for Strategic Goal 1:

- The ISS Program, with FY 2014 costs of $2.9 billion, represents 14 percent of NASA's total gross cost. ISS costs were $68 million higher in FY 2014 than in FY 2013. FY 2014 costs were largely driven by successful launches of two domestic commercial cargo transportation systems.

- The SLS program had costs of $1.8 billion in FY 2014, an increase of $199 million over FY 2013 costs. The primary driver of SLS costs was continued development of the SLS heavy-lift rocket for the Launch Vehicles project. The SLS program completed a key development milestone in 2014, the Critical Design Review of the SLS Core Stage.

- The Orion MPCV program, with costs of $1.0 billion in FY 2014, is preparing the Orion spacecraft for Exploration Flight Test-1 in December 2014. In FY 2014, NASA assembled the parts, components, structures, and mechanisms into the Orion crew module, service module, and launch abort system.

Other Strategic Goal 1 programs with significant costs were the James Webb Space Telescope (JWST) and Commercial Crew programs. With costs of $625 million in FY 2014, $27 million higher than in 2013, the JWST made progress toward meeting its planned launch date of October 2018. Commercial Crew program costs decreased by $205 million in FY 2014, to a total cost of $425 million. NASA continued to work with industry providers through this program to complete partner commercial crew transportation system design and provide NASA certification for those systems to carry astronauts into orbit. NASA and its industry partners achieved a critical milestone in FY 2014 with the completion of reviews detailing how

each industry partner plans to meet NASA's certification requirements to transport space station crew members to and from the ISS.

Strategic Goal 2: Advance understanding of Earth and develop technologies to improve the quality of life on our home planet.

Gross costs for Strategic Goal 2 were $3.6 billion, a decrease of $17 million from FY 2013. The costs for this strategic goal represent 18 percent of total Agency gross cost. Almost half of the costs incurred for Strategic Goal 2 are in support of activities performed for other governmental organizations or private entities who reimburse NASA for these costs (earned revenue). The primary reimbursable activities are described in the earned revenue discussion below.

Three of the largest NASA programs supporting Strategic Goal 2 were the Earth Systematic Missions, Earth Science Research, and Earth Science Multi-Mission Operations programs.

- The Soil Moisture Active Passive (SMAP) project within the Earth Systematic Missions program had costs of $140 million in FY 2014, $60.9 million less than FY 2013 costs. SMAP will provide global measurements of soil moisture and its freeze/thaw state. These measurements will be used to enhance understanding of processes that link the water, energy and carbon cycles, and to extend the capabilities of weather and climate prediction models. SMAP completed the Instrument Thermal Vacuum Test in June 2014.

- Earth Science Research and Analysis, a major project in the Earth Science Research Program, is comprised mainly of individual investigator activities organized around scientific disciplines. These activities had a total cost in FY 2014 of $140 million, $0.1 million more than FY 2013 costs.

- Multi-Mission Operations projects, with $132 million in FY 2014 costs, acquire, preserve, and distribute observational data from operating spacecraft to support Earth Science focus areas. Costs for these projects were $9 million higher than FY 2013 costs.

Other significant projects contributing to costs for Strategic Goal 2 were the Orbiting Carbon Observatory-2 (OCO-2) and Global Precipitation Measurement (GPM) programs, and efforts to advance the nation's science, technology, engineering, and math (STEM) education. OCO-2 had costs of $90 million in FY 2014, $6 million more than FY 2103. OCO-2, successfully launched on July 2, 2014, will make a completely new set of global satellite measurements of the ways that carbon moves through the atmosphere, land, and ocean. GPM, with FY 2014 costs of $38 million, was launched on February 27, 2014. GPM inaugurates an international satellite constellation to produce frequent global observations of rainfall and snowfall. STEM projects had costs of $55 million in FY 2014, $23 million less than FY 2013.

Strategic Goal 3: Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure.

Gross costs for Strategic Goal 3 were $4.9 billion in FY 2014, a decrease of $165 million from FY 2013. The costs for this strategic goal represent 24 percent of total Agency gross cost. Three of the largest NASA programs supporting Strategic Goal 3 were

Center Management and Operations, Agency Management, and Space Communication and Navigation.

- In FY 2014, Center Management and Operations (CMO) had costs of $2.0 billion in FY 2014, a decrease of $6 million from FY 2013. CMO directly supports Agency programs and projects that reside at and are executed by NASA Centers. CMO provides for the care of institutional assets, establishing and maintaining the staff and their competencies, and the maintenance and operation of facilities required by current and future programs and projects at the Centers.

- NASA's Space Communication and Navigation (SCaN) program, with total FY 2014 costs of $566 million, provides communications services that are essential to the operations of NASA's space flight missions. The three networks, Deep Space Network (DSN), Near Earth Network (NEN) and Space Network (SN) provide support to over 100 NASA and non-NASA missions. To support the network, NASA's twelfth Tracking and Data Relay Satellite (TDRS) spacecraft (TDRS-L) was launched in January 2014 and has been accepted for operations.

- Agency Management, with FY 2014 costs of $385 million, provides for the management and oversight of Agency missions, programs, functions and performance of NASA-wide mission support activities. Agency Management operations activities at NASA Headquarters ensure that core services are ready and available Agency-wide for performing mission roles and responsibilities, Agency operations are effective and efficient, and activities are conducted in accordance with all statutory, regulatory, and fiduciary requirements.

Earned Revenue

Total earned revenue, for example, work performed by NASA for other governmental organizations or private entities, for the Agency was $2.1 billion in FY 2014, a decrease of $150 million from FY 2013. Two programs accounted for 62 percent of NASA's earned revenue in FY 2014: Joint Polar Satellite System (JPSS) and Geostationary Operational Environmental Satellites – R Series (GOES-R).

NASA supports JPSS in partnership with the National Oceanic and Atmospheric Administration (NOAA). JPSS had earned revenue of $759 million in FY 2014, an increase of $13 million from FY 2013. JPSS completed the Critical Design Review in FY 2014, with launch scheduled for early 2017.

Also in partnership with NOAA, GOES-R provides improvements in the detection and observations of environmental phenomena that directly affect public safety, protection of property and our nation's economic health and prosperity. The first satellite in the GOES-R series is scheduled for launch in early 2016. Earned revenue from GOES-R was $564 million in FY 2014, an increase of $59 million from FY 2013.

Earned revenue by strategic goal is presented on the Statement of Net Cost, which can be found in the Financial Section (page 71) of this AFR.

Limitation of the Financial Statements

The principal financial statements have been prepared to report the financial position and results of operations of NASA, pursuant to the requirements of 31 U.S.C. 3515(b). While the statements have been prepared from the books and records of NASA in accordance with the U.S. generally accepted accounting principles for Federal entities and in the formats prescribed by the Office of Management and Budget (OMB) Circular A-136, the statements are in addition to the financial reports used to monitor and control budgetary resources, which are prepared from the same books and records. The statements should be read with the realization that they are for a component of the U.S. Government, a sovereign entity.

Image Caption: Orbiting Carbon Observatory-2 (OCO-2) Aboard Delta II Rocket - The launch gantry is rolled back to reveal the United Launch Alliance Delta II rocket with the OCO-2 satellite onboard, at the Space Launch Complex 2, Monday, June 30, 2014, Vandenberg Air Force Base, Calif. OCO-2 will measure the global distribution of carbon dioxide, the leading human-produced greenhouse gas driving changes in Earth's climate. (Credit: NASA/Bill Ingalls)

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Systems, Controls, and Legal Compliance

Image Caption: America's Next Rocket (Artist Depiction) - NASA's Space Launch System, or SLS, will be the most powerful rocket in history. The flexible, evolvable design of this advanced, heavy-lift launch vehicle will meet a variety of crew and cargo mission needs. (Credit: NASA)

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Systems, Controls and Legal Compliance

Management Assurances

Administrator's Statement of Assurance

November 14, 2014

NASA management is responsible for establishing and maintaining effective internal control and financial management systems that meet the objectives of the Federal Managers' Financial Integrity Act (FMFIA), the Federal Financial Management Improvement Act (FFMIA), as well as all other related laws and guidance. NASA is committed to a robust and comprehensive internal control program. We recognize that ensuring the effective, efficient, economical, and responsible use of the resources that have been provided to the Agency is not only good stewardship, but also the right approach to maximize our progress toward the realization of our mission goals. Integrity and ethical values are emphasized throughout the Agency and communicated both formally and informally through training, codification in policy, and through organizational norms and culture. As a result, managers and employees throughout the Agency are active on a daily basis in identifying or updating key control objectives, assessing risks, implementing controls or other mitigating strategies, conducting reviews, and taking corrective actions as necessary.

NASA conducted its Fiscal Year 2014 annual assessment of the effectiveness of internal controls over operations and compliance with applicable laws and regulations in accordance with FMFIA and the Office of Management and Budget (OMB) Circular A-123, *Management's Responsibility for Internal Control*. Based on the results of this evaluation, NASA can provide reasonable assurance that its internal controls over the effectiveness and efficiency of operations and compliance with applicable laws and regulations as of September 30, 2014, were operating effectively and no material weaknesses were found in the design or operation of the internal controls.

In addition, NASA's Office of the Chief Financial Officer performed an assessment of the effectiveness of internal controls over financial reporting in compliance with OMB Circular A-123, Appendix A-*Internal Control over Financial Reporting*. Based on the results of the evaluation, there were no material weaknesses identified in the design or operation of these controls. NASA provides reasonable assurance that internal controls over financial reporting are operating effectively, as of June 30, 2014. Finally, in accordance with the requirements of

the FFMIA, we assessed the implementation and maintenance of NASA financial management systems. We found that these substantially comply with Federal financial management systems requirements, applicable Federal accounting standards, and the U.S. Government Standard General Ledger at the transaction level.

In conclusion, NASA makes an "unqualified statement of assurance" that its internal controls for FY 2014 were operating effectively.

NASA will continue its commitment to ensuring a sound system of internal control exists over operations, reporting, and financial systems and will continue to monitor and enhance its quality assurance activities.

Charles F. Bolden, Jr.
Administrator

Financial Systems Strategies

NASA's Core Financial (CF) management system is the Systems Applications & Products (SAP) Enterprise Resources Planning (ERP) Suite. The CF system is an Agency-wide solution for all Centers and installations, and has served as NASA's financial accounting system of record since 2003. It is the foundation of NASA's ability to achieve its financial management objectives and management of the budget. Since its initial implementation, CF has been enhanced and expanded to demonstrate measurable progress toward achieving compliance with Federal Managers' Financial Integrity Act (FMFIA) and Federal Financial Management Improvement Act (FFMIA), and an unmodified financial audit opinion.

To date, NASA has implemented the following modules: funds management, financial accounting, sales and distribution, investment management, materials management, controlling (cost), project systems, and real estate, as well as a Contractor Cost Reporting (CCR) extension. Collectively, these integrated components make up NASA's financial system of record for financial statements, external reports, project analysis, and management control. Transactions within the integrated modules and interfaces are recorded on a real time basis. The SAP ERP is supported by other commercial off-the-shelf (COTS) software, NASA developed applications, and interfaces with systems managed by other Federal agencies.

NASA's Contract Management Module (CMM) / PRISM is used as a hub to modernize/standardize NASA's contract writing. It provides an integrated Agency-wide procurement solution that interfaces real time with CF and promotes NASA's internal initiatives to optimize business operations.

This year, NASA completed implementation of the Concur Government Edition (CGE) system, an eGov initiative providing Agency-wide travel processing, and successfully integrated this system with its CF system.

Also this year, NASA developed and released three new enhancements to the Performance Measures Module (PMM), which supports NASA's Budget Formulation and Execution (BFEM) system, to meet current GPRAMA mandates and OMB requirements for Federal strategic planning, performance management and reporting. Currently, NASA is in the process of developing enhancement capabilities required by GPRAMA and OMB to meet current mandates.

NASA is also in the process of implementing Wide Area Workflow, the Department of Defense e-invoicing solution that will improve payment cycle time, reduce interest penalties, and reduce long-term operating cost.

These systems, along with others, such as Business Intelligence, eBudget, Metadata Manager and Bankcard, are integrated within the NASA Financial Management System environment. The NASA Enterprise Applications Competency Center (NEACC) operates and maintains the broad spectrum of NASA's Enterprise Applications for nine lines of business (including Financial Management, Procurement, and Human Capital), with an emphasis on fully integrating business process expertise with application and technical know-how. Administrative and transactional business activities are supported by the NSSC and support the following functional areas: financial management,

human resources, procurement, information technology and Agency business support.

In sum, NASA's CF system, its interfacing systems, and Agency and Center personnel support the execution of NASA's Strategic and Project Performance Goals and allow NASA to effectively manage enterprise data and information per the Agency's vision for Enterprise Architecture. The integrated nature of the business systems and processes have strengthened NASA's internal controls and transparency. The CF System enables NASA to achieve its Enterprise Architecture target-state goal of systems rationalization and providing cost-effective and reliable applications to support NASA's mission.

Looking Forward

Image Caption: Grand Swirls from NASA's Hubble - This new Hubble image shows NGC 1566, a beautiful galaxy located approximately 40 million light-years away in the constellation of Dorado (The Dolphinfish). NGC 1566 is an intermediate spiral galaxy, meaning that while it does not have a well-defined bar-shaped region of stars at its center — like barred spirals — it is not quite an unbarred spiral either. (Credit: ESA/ Hubble & NASA, Acknowledgement: Flickr user Det58)

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Looking Forward

In FY 2015, NASA will build on the successes achieved across FY 2014, as we expand the frontiers of knowledge, capability, and opportunity. NASA, our partners, and the Nation are embarking upon an ambitious exploration program that will incorporate new technologies and leverage proven capabilities as we expand our reach out into the solar system. NASA is entering a new era in human spaceflight of exploration beyond low Earth orbit. This new era in space exploration will commence in early FY 2015 with Exploration Flight Test-1 (EFT-1), the first launch of the Orion MPCV spacecraft. This will be the first key test flight of a component of the architecture needed for human exploration beyond low Earth orbit. The unmanned EFT-1 flight will take Orion to an altitude of approximately 3,600 miles above the Earth's surface, more than 15 times farther than the International Space Station's (ISS) orbital position. By flying Orion out to those distances, NASA will be able to see how Orion performs in and returns from deep space journeys.

In addition, to gain knowledge about how humans live and work in space, a joint US-Russian one-year mission will start in 2015. American astronaut Scott Kelly and Russian cosmonaut Mikhail Kornienko will live on the ISS for one year, which is twice as long as crew members typically stay on the space station. The mission's investigation of genetics and the effects of long-duration spaceflight on humans will be assisted through comparisons with astronaut Scott Kelly's identical twin, retired astronaut Mark Kelly, who will remain on Earth.

Also in FY 2015, SpaceX, one of NASA's commercial partners, will launch the Bigelow Expandable Activity Module (BEAM) to the ISS – an expandable habitat for ISS. BEAM will demonstrate inflatable technology and applications for human spaceflight and exploration activities.

NASA science programs will continue to seek answers to profound questions, address the need to understand our place in the Universe, and provide information to policy makers who address issues affecting all life on Earth. NASA is also working to improve its operations and is increasingly launching its science missions on schedule and on budget.

NASA will launch several science missions in FY 2015, including the Magnetospheric MultiScale Mission (MMS). This unmanned mission will utilize four spacecraft flying in a tetrahedral formation to conduct research on the Earth's magnetosphere. NASA will also launch the Soil Moisture Active Passive (SMAP) mission. This fleet of NASA satellites will observe every phase of Earth's critical water cycle. SMAP will measure surface soil moisture and freeze-thaw state. These measurements will enable improvements in weather forecasts, flood and drought forecasts, and predictions of agricultural productivity and climate change.

NASA will also continue to make strides in the development of other key science missions for future launches including:

- Solar Probe Plus (SPP)
- Solar Orbiter Collaboration (SOC)

- Ionospheric Connection (ICON)
- Global-scale Observations of the Limb and Disk (GOLD)
- Transiting Exoplanet Survey Satellite (TESS)
- Neutron star Interior Composition Explorer (NICER)
- Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer (OSIRIS-REx)
- InSight
- Mars 2020
- Ice, Cloud,and land Elevation Satellite-2 (ICESat-2)
- James Webb Space Telescope (JWST)

NASA expects its innovative research activities and technology development to lead to future spacecraft advancements, support life in space, and enable the next generation air transportation system. American technological leadership is vital to our national security, economic prosperity, and global standing. NASA will remain committed to contributing to STEM education, the Nation's economic vitality, and stewardship of Earth.

Humanity's future in space is bright, and NASA is leading the way. We reach for new heights, toward our next giant leap. As a foundational component of this journey, NASA will continue to focus on fiscal responsibility, performance management, and long-term affordability, all the while addressing management challenges or risks that may pose a roadblock to future success.

Financials

Image Caption: Tracking and Data Relay Satellite Launch Lights Up the Night Sky - A United Launch Alliance Atlas V rocket lights up the night sky over Space Launch Complex 41 at Cape Canaveral Air Force Station in Florida as it carries NASA's Tracking and Data Relay Satellite, or TDRS-L, to Earth orbit. Launch was at 9:33 p.m. EST on Thursday, Jan. 23 during a 40-minute launch window. (Credit: NASA/Dan Casper)

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Introduction to the Principal Financial Statements

The principal financial statements are prepared to report the financial position and results of operations of the National Aeronautics and Space Administration (NASA), pursuant to the requirements of 31 U.S.C. 3515 (b). The statements are prepared from the records of NASA in accordance with the U.S. generally accepted accounting principles and the formats prescribed by the Office of Management and Budget (OMB) in Circular No. A-136, *Financial Reporting Requirements*. The statements are in addition to financial reports prepared by NASA in accordance with OMB and U.S. Department of the Treasury (Treasury) directives to monitor and control the status and use of budgetary resources, which are prepared from the same records. The statements should be read with the understanding that they are for a component of the U.S. Government, a sovereign entity. One important implication of this is that NASA has no authority to pay liabilities not covered by budgetary resources. Liquidation of such liabilities requires enactment of an appropriation. Comparative data for FY 2013 is included where applicable. The principal financial statements, which include the following, are the responsibility of management:

- **Consolidated Balance Sheet** provides information on assets, liabilities, and net position as of the end of the reporting period. Net position is the difference between assets and liabilities. It is a summary measure of the Agency's financial condition at the end of the reporting period.

- **Consolidated Statement of Net Cost** reports net cost of operation during the reporting periods by strategic goal and at the entity level. It is a measure of Gross Cost of Operations less Earned Revenue, and represents cost to taxpayers for achieving each strategic goal and Agency mission at the entity level.

- **Consolidated Statement of Changes in Net Position** reports the beginning balance of net position, current financing sources and use of resources, unexpended resources (transactions that affect net position) for the reporting period, and ending net position for the current period.

- **Combined Statement of Budgetary Resources** reports information on sources and status of budgetary resources for the reporting period. Information in this statement is reported on the budgetary basis of accounting which supports compliance with budgetary controls and controlling legislation.

- **Required Supplementary Stewardship Information** provides information on NASA's Research and Development costs by strategic goal.

- **Required Supplementary Information** contains a Combining Statement of Budgetary Resources and information on Deferred Maintenance.

Financial Statements, Notes, and Supplemental Information

National Aeronautics and Space Administration
Consolidated Balance Sheet
As of September 30, 2014 and 2013
(In Millions of Dollars)

	Audited 2014	Audited 2013
Assets (Note 2):		
Intragovernmental:		
Fund Balance with Treasury (Note 3)	$ 10,293	$ 9,771
Investments (Note 4)	17	17
Accounts Receivable (Note 5)	161	156
Total Intragovernmental	10,471	9,944
Accounts Receivable, Net (Note 5)	5	2
Property, Plant and Equipment, Net (Note 6)	7,679	8,261
Total Assets	**$ 18,155**	**$ 18,207**
Stewardship PP&E (Note 7)		
Liabilities (Note 8):		
Intragovernmental:		
Accounts Payable	$ 113	$ 89
Other Liabilities (Note 10)	82	92
Total Intragovernmental	195	181
Accounts Payable	1,452	1,314
Federal Employee and Veteran Benefits	48	51
Environmental and Disposal Liabilities (Note 9)	1,274	1,243
Other Liabilities (Note 10)	1,591	1,486
Total Liabilities	**4,560**	**4,275**
Commitments and Contingencies (Note 11)		
Net Position:		
Unexpended Appropriations	7,413	7,113
Cumulative Results of Operations	6,182	6,819
Total Net Position	**13,595**	**13,932**
Total Liabilities and Net Position	**$ 18,155**	**$ 18,207**

The accompanying notes are an integral part of this statement.

National Aeronautics and Space Administration
Consolidated Statement of Net Cost
For the Fiscal Years Ended September 30, 2014 and 2013
(In Millions of Dollars)

	Audited 2014	Audited 2013
Cost by Strategic Goal (Note 12)		
Strategic Goal 1 – Expand the frontiers of knowledge, capability, and opportunity in space		
Gross Costs	$ 11,788	$ 11,496
Less: Earned Revenue	277	274
Net Costs	11,511	11,222
Strategic Goal 2 – Advance understanding of Earth and develop technologies to improve the quality of life on our home planet		
Gross Costs	$ 3,646	$ 3,663
Less: Earned Revenue	1,731	1,656
Net Costs	1,915	2,007
Strategic Goal 3 – Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure		
Gross Costs	$ 4,895	$ 5,060
Less: Earned Revenue	127	355
Net Costs	4,768	4,705
Net Cost of Operations		
Gross Costs	$ 20,329	$ 20,219
Less: Earned Revenue	2,135	2,285
Net Cost	**$ 18,194**	**$ 17,934**

The accompanying notes are an integral part of this statement.

National Aeronautics and Space Administration
Consolidated Statement of Changes in Net Position
For the Fiscal Years Ended September 30, 2014 and 2013
(In Millions of Dollars)

	Audited 2014	Audited 2013
Cumulative Results Of Operations:		
Beginning Balances	$ 6,819	$ 7,516
Budgetary Financing Sources:		
Appropriations Used	17,320	16,974
Nonexchange Revenue	4	14
Other Financing Sources:		
Donations and Forfeitures of Property	7	3
Transfers In/Out Without Reimbursement	49	109
Imputed Financing	178	150
Other	(1)	(13)
Total Financing Sources	17,557	17,237
Net Cost of Operations	(18,194)	(17,934)
Net Change	(637)	(697)
Cumulative Results of Operations	**6,182**	**6,819**
Unexpended Appropriations:		
Beginning Balance	7,113	7,234
Budgetary Financing Sources:		
Appropriations Received	17,647	17,877
Other Adjustments	(27)	(1,024)
Appropriations Used	(17,320)	(16,974)
Total Budgetary Financing Sources	300	(121)
Unexpended Appropriations	**7,413**	**7,113**
Net Position	**$ 13,595**	**$ 13,932**

The accompanying notes are an integral part of this statement.

National Aeronautics and Space Administration
Combined Statement of Budgetary Resources
For the Fiscal Years Ended September 30, 2014 and 2013
(In Millions of Dollars)

	Audited 2014	Audited 2013
Budgetary Resources:		
Unobligated Balance, Brought Forward, October 1	$ 1,044	$ 933
Recoveries of Prior Year Unpaid Obligations	339	351
Other Changes in Unobligated Balance	(27)	(26)
Unobligated Balance from Prior Year Budget Authority, Net	1,356	1,258
Appropriations	17,647	16,880
Spending Authority from Offsetting Collections	2,501	2,617
Total Budgetary Resources	**$ 21,504**	**$ 20,755**
Status of Budgetary Resources:		
Obligations Incurred (Note 13)	$ 20,353	$ 19,711
Unobligated Balance, End of Year:		
Apportioned	1,018	903
Unapportioned	133	141
Total Unobligated Balance, End of Year	1,151	1,044
Total Status of Budgetary Resources	**$ 21,504**	**$ 20,755**
Change in Obligated Balance:		
Unpaid Obligations:		
Unpaid Obligations, Brought Forward, October 1	$ 9,771	$ 10,284
Obligations Incurred (Note 13)	20,353	19,711
Outlays (Gross) (-)	(19,661)	(19,873)
Recoveries of Prior Year Unpaid Obligations (-)	(339)	(351)
Unpaid Obligations, End of Year	10,124	9,771
Uncollected Payments:		
Uncollected Payments, Federal Sources, Brought Forward, October 1 (-)	(1,051)	(1,318)
Change in Uncollected Payments, Federal Sources	63	267
Uncollected Payments, Federal Sources, End of Year (-)	(988)	(1,051)
Memorandum (Non-Add) Entries		
Obligated Balance, Start of Year	**8,720**	**8,966**
Obligated Balance, End of Year	**$ 9,136**	**$ 8,720**
Budget Authority and Outlays, Net:		
Budget Authority, Gross	$ 20,148	$ 19,497
Actual Offsetting Collections (-)	(2,564)	(2,884)
Change in Uncollected Payments, Federal Sources	63	267
Budget Authority, Net	**$ 17,647**	**$ 16,880**
Outlays, Gross	$ 19,661	$ 19,873
Actual Offsetting Collections (-)	(2,564)	(2,884)
Outlays, Net	17,097	16,989
Distributed Offsetting Receipts (-)	(5)	(13)
Agency Outlays, Net	**$ 17,092**	**$ 16,976**

The accompanying notes are an integral part of this statement.

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Note 1: Summary of Significant Accounting Policies

Reporting Entity

The National Aeronautics and Space Administration (NASA) is an independent agency established by Congress on October 1, 1958 by the National Aeronautics and Space Act of 1958. NASA was incorporated from its predecessor agency, the National Advisory Committee for Aeronautics, which provided technical advice to the United States (U.S.) aviation industry and performed aeronautics research. Today, NASA serves as the principal Agency of the United States Government for initiatives in civil space and aviation.

NASA is organized into four Mission Directorates supported by one Mission Support Directorate (see Organization at page 7):

- Aeronautics Research: conducts research which enhances aircraft performance, environmental compatibility, capacity, flexibility, and safety of the future air transportation system;
- Human Exploration and Operations: develops new capabilities, supporting technologies and foundational research for affordable, sustainable human and robotic exploration;
- Science: explores the Earth, Moon, Mars, and beyond; charts the best route of discovery, and obtains the benefits of Earth and space exploration for society; and
- Space Technology: develops new technologies needed to support current and future NASA missions, other agencies and the aerospace industry.

The Agency's administrative structure includes the Strategic Management Council, Mission Support Council, Program Management Council, and other Committees to integrate strategic, tactical, and operational decisions in support of strategic focus and direction.

Operationally, NASA is organized into nine Centers across the country, the Headquarters Office, the NSSC, and the JPL. JPL is a Federally funded research and development center (FFRDC), operated for NASA by a contractor, Caltech, staffed by Caltech employees in NASA-owned facilities.

The accompanying financial statements include the accounts of all funds which have been established and maintained to account for the resources under the control of NASA management.

Basis of Accounting and Presentation

These consolidated financial statements are prepared in accordance with the U.S. generally accepted accounting principles and Federal Accounting Standards Advisory Board standards in the format prescribed by the OMB Circular No. A-136, *Financial Reporting Requirements, Revised* (September 2014). FASAB authority to set Federal government accounting standards is recognized by the American Institute of Certified Public Accountants (AICPA). The financial statements present the financial position, net cost of operations, changes in net position, and budgetary resources of NASA, as required by the Chief Financial Officers Act of 1990, Public Law (P.L.) 101-576, and the Government Management Reform Act (P.L. 101-356).

The financial statements should be read with the realization that they are for a com-

ponent of the U.S. Government, a sovereign entity. One important implication of this is that liabilities cannot be liquidated without legislation providing resources and legal authority to do so. The accounting structure of Federal agencies is designed to reflect proprietary and budgetary accounting. Proprietary accounting uses the accrual method of accounting. Under the accrual method of accounting, revenues are recognized when earned and expenses are recognized when incurred, without regard to the timing of receipt or payment of cash. Budgetary accounting does not use the accrual method of accounting; it accounts for the sources and status of funds to facilitate compliance with legal controls over the use of Federal funds. Beginning in FY 2014, the Statement of Net Cost is presented by 3 strategic goals compared to 6 strategic goals in FY 2013.

Budgets and Budgetary Accounting

NASA complies with Federal budgetary accounting guidelines of OMB Circular No. A-11, *Preparation, Submission and Execution of the Budget*, *Revised* (July 2014). Congress funds NASA's operations through nine main appropriations: Science, Aeronautics, Exploration, Space Operations, Education, Cross-Agency Support, Space Technology, Inspector General, and Construction and Environmental Compliance and Restoration. Reimbursements received under reimbursable service agreements cover the cost of goods and services NASA provides to other Federal entities or non-Federal entities and are recorded as Spending Authority from Offsetting Collections on the Combined Statement of Budgetary Resources.

Research and Development (R&D), Other Initiatives and Similar Costs

NASA makes substantial R&D investments for the benefit of the United States. The R&D programs include activities to extend our knowledge of Earth, its space environment, and the Universe; and to invest in new aeronautics and advanced space transportation technologies supporting the development and application of technologies. Following guidance outlined in the FASAB Technical Release No. 7, *Clarification of Standards Relating to the National Aeronautics and Space Administration's Space Exploration Equipment*, NASA applies the Financial Accounting Standards Board's (FASB) Accounting Standards Codification (ASC) 730-10-25, *Research and Development - Recognition*, and FASB ASC 730-10-50 *Research and Development - Disclosure*, to its R&D projects.

Use of Estimates

The preparation of financial statements requires management to make assumptions and reasonable estimates affecting the reported amounts of assets and liabilities and disclosures of contingent liabilities as of the date of the financial statements and the reported amounts of revenues and expenses for the reporting period. Accordingly, actual results may differ from those estimates.

Fund Balance with Treasury (FBWT)

The U.S. Department of the Treasury (Treasury) collects and disburses cash on behalf of Federal agencies during the fiscal year. The collections include funds appropriated by Congress to fund the Agency's operations and revenues earned for services provided to other Federal agencies or the public. The disbursements are for goods and services received in support of its operations and other liabilities. FBWT is the balance of cash NASA has in its account with the Treasury. NASA's FBWT is comprised of balances in

general funds, trust funds, working capital funds, and other types of funds.

Investments in U.S. Government Securities

NASA investments include the following Intragovernmental non-marketable securities:

(1) The Endeavor Teacher Fellowship Trust Fund (Endeavor Trust Fund) was established from public donations in tribute to the crew of the Space Shuttle Challenger. The Endeavor Trust Fund bi-annual interest earned is re-invested in short-term bills. P.L. 102-195 requires the interest earned from the Endeavor Trust Fund investments be used to create the Endeavor Teacher Fellowship Program.

(2) The Science, Space and Technology Education Trust Fund (Challenger Trust Fund) was established to advance science and technology education. The Challenger Trust Fund balance is invested in short-term bills and long-term bonds. P.L. 100-404 requires that a quarterly payment of $250,000 be sent to the Challenger Center from interest earned on the Challenger Trust Fund investments. In order to meet the requirement of providing funds to the Challenger Center, NASA invests the bi-annual interest earned in short-term bills with maturity that coincides with quarterly payments of $250,000 to beneficiaries. Interest received in excess of amount needed for quarterly payment to beneficiaries is invested in long-term bonds.

Accounts Receivable

Most of NASA's accounts receivable is for intragovernmental reimbursements for cost of goods and services provided to other Federal agencies; the rest is for debts to NASA by non-Federal government entities. Allowances for delinquent non-Federal accounts receivable are based on factors such as: aging of accounts receivable, debtors' ability to pay, payment history, and other relevant factors. Delinquent non-Federal accounts receivable over 180 days are referred to Treasury for collection, wage garnishment or cross-servicing in accordance with the Debt Collection Improvement Act of 1996 (DCIA). The Digital Accountability and Transparency Act of 2013 (DATA Act) amended the DCIA requirement of 180 days to 120 days. NASA is working to implement the new 120 day referral of delinquent debt to Treasury.

Operating Materials and Supplies

NASA does not maintain inventory stock for resale. The Agency follows the Purchases method of accounting for operating materials and supplies under which it expenses operating materials and supplies when purchased, not when used.

Property, Plant, and Equipment

NASA reports depreciation expense using the straight-line method over an asset's estimated useful life, beginning with the month the asset is placed in service. Property, plant and equipment (PP&E) with acquisition costs of $100,000 or more, a useful life of 2 years or more, and R&D assets that are determined at the time of acquisition to have alternative future use, are capitalized. PP&E and R&D assets that do not meet these capitalization criteria are expensed. Capitalized costs include costs incurred by NASA to bring the property to a form and location suitable for its intended use. Certain NASA assets are held by government contractors. Under provisions of the Federal Acquisition Regulation (FAR), the contractors are responsible for the control and accountability of the assets in their possession. These

Government-owned, contractor-held assets are included within the balances reported in NASA's financial statements.

NASA has barter agreements with international entities; the assets and services received under these barter agreements are unique, with limited easement to only a few countries, as these assets are on the International Space Station (ISS). The intergovernmental agreements state that the parties will seek to minimize the exchange of funds in the cooperative program, including the use of barters to provide goods and services. NASA has received some assets from these parties in exchange for future services. The fair value is indeterminable; therefore, no value was ascribed to these transactions in accordance with FASB ASC 845-10-25 *Non-Monetary Transactions – Recognition* and ASC 845-10-50 *Non-Monetary Transactions – Disclosure*. The amounts reflected in NASA's financial reports for the ISS exclude components of the ISS owned or provided by other participants in the ISS.

Statement of Federal Financial Accounting Standards (SFFAS) No. 10, *Accounting for Internal Use Software* requires the capitalization of internally developed, contractor developed, and commercial off-the-shelf-software. Capitalized costs for internally developed software include the full costs (direct and indirect) incurred during the software development stage only. For purchased software, capitalized costs include amounts paid to vendors for the software and other material costs, incurred by NASA to implement and make the software ready for use through acceptance testing. When NASA purchases software as part of a package of products and services (for example: training, maintenance, data conversion, reengineering, site licenses, and rights to future upgrades and enhancements), capitalized and non-capitalized costs of the package are allocated among individual elements on the basis of a reasonable estimate of their relative fair market values. Costs not susceptible to allocation between maintenance and relatively minor enhancements are expensed. Software in progress of being developed is not amortized until placed in service. NASA capitalizes costs for internal use software when the total projected cost is $1 million or more and the expected useful life of the software is 5 years or more.

Liabilities Covered by Budgetary Resources

As a component of a sovereign entity, NASA cannot pay for liabilities unless authorized by law and covered by budgetary resources. Liabilities covered by budgetary resources are those for which appropriated funds are available as of the balance sheet date. Examples of covered liabilities include accounts payable and employees' salaries. Budgetary resources include unobligated balances of budgetary resources at the beginning of the year, new budget authority, and spending authority from offsetting collections.

Liabilities and Contingencies Not Covered by Budgetary Resources

Liabilities not covered by budgetary resources are those for which congressional appropriation is required. Liabilities not covered by budgetary resources include future environmental cleanup liability, legal claims, pensions and other retirement benefits, workers' compensation, annual leave, and cancelled appropriations.

Federal Employee and Veterans' Benefits

A liability is recorded for workers' compensa-

tion claims related to the Federal Employees' Compensation Act (FECA), administered by the U.S. Department of Labor. The FECA provides income and medical cost protection to covered Federal civilian employees injured on the job, employees who have incurred a work-related occupational disease, and beneficiaries of employees whose death is attributable to a job-related injury or occupational disease. The FECA program initially pays valid claims and subsequently seeks reimbursement from the Federal agencies employing the claimants. The FECA liability includes the actuarial liability for estimated future costs of death benefits, workers' compensation, and medical and miscellaneous costs for approved compensation cases.

Personnel Compensation and Benefits

Annual, Sick and Other Leave

Annual leave is accrued as it is earned; the accrual is reduced as leave is taken. Each year, the balance in the accrued annual leave account is adjusted to reflect current pay rates. To the extent current or prior year appropriations are not available to fund annual leave earned but not taken, funding will be obtained from future financing sources. Sick leave and other types of non-vested leave are expensed as taken.

Retirement Benefits

NASA employees participate in the Civil Service Retirement System (CSRS), a defined benefit plan, or the Federal Employees Retirement System (FERS), a defined benefit and contribution plan. For CSRS employees, NASA makes contributions of 7.0 percent of gross pay. For FERS employees, NASA makes contributions of gross pay of 11.9 percent to the defined benefit plan, 1.0 percent to a retirement savings plan (contribution plan), and matches employee contributions up to an additional 4.0 percent of gross pay. For those employees participating in FERS, a thrift savings plan is automatically established and NASA makes a mandatory contribution of 1.0 percent to this plan.

Insurance Benefits

SFFAS No. 5, *Accounting for Liabilities of the Federal Government* requires Government agencies to report the full cost of Federal Employee Health Benefits (FEHB), and the Federal Employees Group Life Insurance (FEGLI) Programs. NASA uses the applicable cost factors and data provided by the Office of Personnel Management to value these liabilities.

Reclassifications of 2013 Information

Certain reclassifications have been made to FY 2013 financial statements, footnotes and supplemental information to better align with the Agency's strategic and performance plans effective in FY 2014. The reclassifications were made to FY 2013 pursuant to changes in the strategic plan.

Note 2: Non-Entity Assets

Non-entity assets are assets held by NASA but not available for obligation. The total non-entity assets during FY 2014 and FY 2013 is less than one-half million dollars.

(In Millions of Dollars)	2014	2013
Total Non-Entity Assets	$ —	$ —
Total Entity Assets	18,155	18,207
Total Assets	**$ 18,155**	**$ 18,207**

Note 3: Fund Balance With Treasury

Treasury processes cash receipts and disbursements for NASA. Those transactions are reconciled against NASA records. Fund Balance with Treasury (FBWT) is NASA's cash balance with the Treasury. The FBWT is comprised of balances in general funds, trust funds, working capital fund, and other types of funds. General Funds primarily consist of appropriated funds for NASA. Trust Funds include balances in the Endeavor Trust Fund; Challenger Trust Fund; and Gifts and Donations. The Working Capital Fund (WCF) consists of balances related to NSSC, IT Infastructure Integration Program (I3P) and Scientific Equipment Work Package (SEWP). Other types of funds include Deposit funds; and Budget Clearing and Suspense funds.

(In Millions of Dollars)	2014	2013
Fund Balances:		
General Funds	$ 10,135	$ 9,615
Trust Funds	1	2
Working Capital Fund	152	147
Other Fund Types	5	7
Total	**$ 10,293**	**$ 9,771**

The Status of Fund Balance with Treasury represents the total fund balance recorded in the general ledger for unobligated and obligated balances. Unobligated Balances — Available is the amount remaining in appropriation funds available for obligation. Unobligated Balances — Unavailable is the amount remaining in appropriation funds used only for adjustments to previously recorded obligations. Obligated Balances - Not Yet Disbursed is the cumulative amount of obligations incurred for which outlays have not been made. Non-budgetary FBWT is comprised of amounts in other types of funds.

(In Millions of Dollars)	2014	2013
Status of Fund Balances with Treasury:		
Unobligated Balances		
Available	$ 1,018	$ 903
Unavailable	133	141
Obligated Balance Not Yet Disbursed	9,136	8,720
Non-Budgetary FBWT	6	7
Total	**$ 10,293**	**$ 9,771**

Note 4: Investments

Investments consist of non-marketable par value intragovernmental securities issued by Treasury's Bureau of the Fiscal Service. Trust Fund balances are invested in Treasury securities, which are purchased at either a premium or discount, and redeemed at par value exclusively through Treasury's Federal Investment Branch. The effective-interest method is used to amortize premiums on bonds, and the straight-line method is used to amortize discounts on bills.

Interest receivable on investments was less than one-half million dollars. In addition, NASA did not have any adjustments resulting from the sale of securities prior to maturity or any change in value that is more than temporary.

2014							
(In Millions of Dollars)	Cost	Amortization Method	Amortized (Premium) Discount	Interest Receivable	Investments, Net	Other Adjustments	Market Value Disclosure
Intragovernmental Securities:							
Non-Marketable:		Straight-Line					
Par value	$ 20	Effective-interest 0.030 - 6.602%	$ (3)	$ —	$ 17	$ —	$ 17
Total	**$ 20**		**$ (3)**	**$ —**	**$ 17**	**$ —**	**$ 17**

2013							
(In Millions of Dollars)	Cost	Amortization Method	Amortized (Premium) Discount	Interest Receivable	Investments, Net	Other Adjustments	Market Value Disclosure
Intragovernmental Securities:							
Non-Marketable:		Straight-Line					
Par value	$ 19	Effective-interest 0.025 - 6.602%	$ (2)	$ —	$ 17	$ —	$ 17
Total	**$ 19**		**$ (2)**	**$ —**	**$ 17**	**$ —**	**$ 17**

Note 5: Accounts Receivable, Net

The Accounts Receivable balance represents net valid claims by NASA to cash or other assets of other entities. Intragovernmental Accounts Receivable represents reimbursements due from other Federal entities for goods and services provided by NASA on a reimbursable basis. Accounts Receivable Due from the Public is the total of miscellaneous debts owed to NASA from employees and/or smaller reimbursements from other non-Federal entities. A periodic evaluation of public accounts receivable is performed to estimate any uncollectible amounts based on current status, financial and other relevant characteristics of debtors, and the overall relationship with the debtor. An allowance for doubtful accounts is recorded for Accounts Receivable Due from the Public in order to reduce Accounts Receivable to its Net Realizable Value in accordance with SFFAS No. 1, *Accounting for Selected Assets and Liabilities*. The total allowance for doubtful accounts during FY 2014 and FY 2013 is less than one–half million dollars.

2014			
(In Millions of Dollars)	Accounts Receivable	Allowance for Uncollectible Accounts	Net Amount Due
Intragovernmental	$ 161	$ —	$ 161
Public	5	—	5
Total	**$ 166**	**$ —**	**$ 166**

2013			
(In Millions of Dollars)	Accounts Receivable	Allowance for Uncollectible Accounts	Net Amount Due
Intragovernmental	$ 156	$ —	$ 156
Public	2	—	2
Total	**$ 158**	**$ —**	**$ 158**

Note 6: Property, Plant and Equipment, Net

NASA reports depreciation expense using the straight-line method over an asset's estimated useful life, beginning with the month the asset is placed in service. Property, plant and equipment (PP&E) with acquisition costs of $100,000 or more, a useful life of 2 years or more, and R&D assets that are determined at the time of acquisition to have alternative future use, are capitalized. PP&E and R&D assets that do not meet these capitalization criteria are expensed. Capitalized costs include costs incurred by NASA to bring the property to a form and location suitable for its intended use. Certain NASA assets are held by government contractors. Under provisions of the Federal Acquisition Regulation (FAR), the contractors are responsible for the control and accountability of the assets in their possession. These Government-owned, contractor-held assets are included within the balances reported in NASA's financial statements. There is no known restriction to the use or convertibility of NASA PP&E.

2014

(In Millions of Dollars)	Depreciation Method	Useful Life	Cost	Accumulated Depreciation	Book Value
Space Exploration PP&E					
International Space Station	Straight-line	5–20 years	$ 12,905	$ (11,050)	$ 1,855
Space Shuttle	Straight-line	5–20 years	92	(92)	—
Assets Under Construction		N/A	1,220	—	1,220
Total			**14,217**	**(11,142)**	**3,075**
General PP&E					
Land		N/A	122	—	122
Structures, Facilities and Leasehold Improvements	Straight-line	15–40 years	9,674	(6,891)	2,783
Institutional Equipment	Straight-line	5–20 years	2,965	(1,819)	1,146
Construction in Process		N/A	535	—	535
Internal Use Software and Development	Straight-line	5 years	275	(257)	18
Total			**13,571**	**(8,967)**	**4,604**
Total Property, Plant and Equipment			**$ 27,788**	**$ (20,109)**	**$ 7,679**

2013

(In Millions of Dollars)	Depreciation Method	Useful Life	Cost	Accumulated Depreciation	Book Value
Space Exploration PP&E					
International Space Station	Straight-line	5–20 years	$ 12,635	$ (9,701)	$ 2,934
Space Shuttle	Straight-line	5–20 years	743	(743)	—
Assets Under Construction		N/A	1,191	—	1,191
Total			**14,569**	**(10,444)**	**4,125**
General PP&E					
Land		N/A	122	—	122
Structures, Facilities and Leasehold Improvements	Straight-line	15–40 years	9,097	(6,770)	2,327
Institutional Equipment	Straight-line	5–20 years	2,305	(1,373)	932
Construction in Process		N/A	735	—	735
Internal Use Software and Development	Straight-line	5 years	266	(246)	20
Total			**12,525**	**(8,389)**	**4,136**
Total Property, Plant and Equipment			**$ 27,094**	**$ (18,833)**	**$ 8,261**

Note 7: Stewardship PP&E

Federal agencies are required to classify and report heritage assets in accordance with SFFAS No. 29, *Heritage Assets and Stewardship Land*.

Stewardship PP&E have physical characteristics similar to those of General PP&E (G-PP&E) but differ from G-PP&E because their value is more intrinsic and not easily determinable in dollars. The only type of stewardship PP&E owned by NASA are heritage assets.

Heritage assets are G-PP&E which possess one or more of the following characteristics:

- Historical or natural significance
- Cultural, educational, or aesthetic value
- Significant architectural characteristics

Dollar value and useful life of heritage assets are not easily determinable. There is no minimum dollar threshold for designating a G-PP&E as a heritage asset, and depreciation expense is not taken on these assets. For these reasons, heritage assets are reported in physical units, rather than with assigned dollar values. In accordance with SFFAS No. 29, the cost of acquisition, improvement, reconstruction, or renovation of heritage assets is expensed in the period incurred.

Heritage assets that are used in day-to-day government operations and have a heritage function are considered "multi-use" heritage assets. Such assets are accounted for as general property, plant and equipment and are capitalized and depreciated in the same manner as other general property, plant and equipment. As of September 30, 2014, NASA had 71 buildings and structures that are considered to be multi-use heritage assets. The value associated with these multi-use heritage assets is reflected in the G-PP&E values reported in Note 6.

When a G-PP&E is designated as a heritage asset, its cost and accumulated depreciation are removed from the books. They remain on the record as heritage assets, except where there is legal authority for transfer or sale at which time they are removed from being a heritage asset. Heritage assets are withdrawn when they are disposed or reclassified as multi-use heritage assets. Heritage assets are generally in fair condition suitable for display.

NASA currently has three major classes of heritage assets: Buildings and Structures; Air and Space Displays and Artifacts; and Art and Miscellaneous Items. The first two categories of heritage assets support NASA's mission by providing the public with tangible examples of assets which were built and deployed to support NASA's mission. These real life assets enhance the public's understanding of NASA's numerous programs. Typically the Buildings and Structures have been designated as National Historic Landmarks.

The third category of heritage assets, Art and Miscellaneous Items, is mainly comprised of items created by artists who have contributed their time and talent to record their impressions of the U.S. Aerospace Program in paintings, drawings, and other media. These works of art not only provide a historic record of NASA projects, but they support NASA's mission by giving the public a new and fuller understanding of advancements in aerospace.

(In Physical Units)	2013	Additions	Withdrawals	2014
Buildings and Structures	12	—	—	12
Air and Space Displays and Artifacts	640	34	60	614
Art and Miscellaneous Items	1,011	13	2	1,022
Total Heritage Assets	**1,663**	**47**	**62**	**1,648**

(In Physical Units)	2012	Additions	Withdrawals	2013
Buildings and Structures	8	5	1	12
Air and Space Displays and Artifacts	635	37	32	640
Art and Miscellaneous Items	1,010	1	—	1,011
Total Heritage Assets	**1,653**	**43**	**33**	**1,663**

Note 8: Liabilities Not Covered by Budgetary Resources

Liabilities not covered by budgetary resources are liabilities for which congressional action is needed before budgetary resources can be provided. They include certain environmental matters (see Note 9, Environmental and Disposal Liabilities for more information), annual leave, workers' compensation under the Federal Employees' Compensation Act (FECA) administered by the Department of Labor, cancelled appropriations, legal claims, and pensions and other retirement benefits.

The present value of the FECA actuarial liability estimate at year-end was calculated by the Department of Labor using a discount rate of 3.46 percent in FY 2014 and 2.73 percent in FY 2013. This liability includes the estimated future costs for claims incurred but not reported or approved as of the end of each year. NASA has recorded Accounts Payable related to cancelled appropriations for which there are contractual commitments to pay. These payables will be funded from appropriations available for obligation at the time a bill is processed, in accordance with P.L. 101-510, National Defense Authorization Act.

(In Millions of Dollars)	2014	2013
Intragovernmental Liabilities:		
Other Liabilities		
Workers' Compensation	$ 10	$ 12
Total Intragovernmental	10	12
Public Liabilities:		
Accounts Payable		
Accounts Payable for Cancelled Appropriations	42	37
Federal Employee and Veterans Benefits		
Actuarial FECA Liability	48	51
Environmental and Disposal Liabilities	1,274	1,243
Less: Environmental and Disposal Liabilities- Funded	68	49
Other Liabilities		
Unfunded Annual Leave	209	205
Contingent Liabilities	36	—
Total Liabilities Not Covered by Budgetary Resources	**1,551**	**1,499**
Total Liabilities Covered by Budgetary Resources	**3,009**	**2,776**
Total Liabilities	**$ 4,560**	**$ 4,275**

Note 9: Environmental and Disposal Liabilities

In accordance with guidance issued by the Federal Accounting Standards Advisory Board, if an agency is required by regulation to clean up hazardous waste resulting from Federal operations, if estimable, the amount of cleanup cost must be reported and/or disclosed in the financial statements.

NASA records an estimated liability for restoration projects, which are known contaminations of property, plant and equipment (PP&E). NASA also records an estimated liability for the future disposal of PP&E which currently, or prior to their disposal, will become contaminated.

NASA assesses the likelihood of required cleanup as probable, reasonably possible or remote. If the likelihood of required cleanup is probable and the cost can be reasonably estimated, a liability is recorded in the financial statements. If the likelihood of required cleanup is reasonably possible, the estimated cost of cleanup is disclosed in the notes to the financial statements. If the likelihood of required cleanup is remote, no liability is recorded or estimate disclosed.

Environmental and Disposal Liabilities represent cleanup costs resulting from:

- Operations including facilities obtained from other governmental entities, that have resulted in contamination from waste disposal methods, leaks and spills;
- Other past activity that created a public health or environmental risk, including identifiable costs associated with asbestos abatement; and
- Total cleanup costs associated with the removal, containment, and/or disposal of hazardous wastes or material and/or property at permanent or temporary closure or shutdown of associated PP&E.

Federal, state, and local statutes and regulations require environmental cleanup. The statutes and regulations most applicable to NASA covering environmental response, cleanup, and monitoring include: the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; the Nuclear Waste Policy Act of 1982; as well as state and local laws.

Consistent with SFFAS No. 5, *Accounting for Liabilities of the Federal Government and with SFFAS 6, Accounting for Property, Plant, and Equipment*, NASA estimates the anticipated environmental disposal cleanup costs for capital PP&E. NASA recognizes and records in its financial statements an environmental cleanup liability for PP&E with a probable and measurable environmental cleanup liability.

(In Millions of Dollars)	2014	2013
Environmental Liabilities		
Restoration Properties	$ 1,188	$ 1,158
Property, Plant & Equipment	64	63
Asbestos	22	22
Total Environmental and Disposal Liabilities	**$ 1,274**	**$ 1,243**

Restoration Projects

NASA recorded a total estimated liability for known restoration projects of $1,188 million in FY 2014. This was an increase of $30 million over the $1,158 million recorded in FY 2013. The increase in this liability is primarily due to the availability of new or updated information on the extent of contamination and refinements to the estimation methodology.

In addition to the probable cleanup costs for known hazardous conditions recognized in the financial statements, there are other remediation sites where the likelihood of required cleanup for known hazardous conditions is reasonably possible. Remediation costs at certain sites classified as reasonably possible were estimated to be $10 million for FY 2014 and $1 million for FY 2013.

With respect to environmental remediation that NASA considers reasonably possible but not estimable, NASA concluded that either the likelihood of a NASA liability is less than probable but more than remote or the regulatory drivers and/or technical data that exist are not reliable enough to calculate an estimate.

PP&E

NASA recorded a total estimated liability for the future closure of PP&E of $64 million in FY 2014. This was an increase of $1 million over the $63 million recorded in FY 2013.

The current proposed decommissioning approach for the International Space Station (ISS) is to execute a controlled targeted deorbit to a remote ocean location. This is consistent with the approach used to deorbit other space vehicles such as Russia's Progress, Europe's Automated Transfer Vehicle (ATV) and Japan's H-II Transfer Vehicle (HTV). The documented target reliability for this decommissioning approach is 99 percent. Prior to decommissioning the ISS, any hazardous materials on board the ISS would be removed or jettisoned. As a result, only residual quantities of hazardous, toxic, and radioactive materials would remain prior to the decommissioning.

Based on past experience with the re-entry of satellites, larger portions or fragments of the ISS would be expected to survive the thermal and aerodynamic stresses of re-entry. However, the historical disposal of satellites and vehicles into broad ocean areas with a controlled deorbit has left little evidence of their re-entry. Any remaining contamination in the ISS debris field would not be expected to have a substantive impact on marine life. Therefore, the probability of NASA incurring environmental cleanup costs related to the ISS is remote, and no estimate for such costs has been developed or reported in these financial statements.

Asbestos

Effective in FY 2013, NASA and other Federal Government agencies are required to accrue and/or disclose the costs and the associated liabilities for abatement of both friable and non-friable asbestos. NASA maintains numerous structures and facilities across each of the Centers which are known to contain asbestos. Based on work completed to date, NASA has determined that information regarding both the quantity of asbestos and the costs associated with the removal and disposal of asbestos is insufficient to reasonably estimate the liability associated with the removal and disposal of asbestos.

As prescribed in FASAB Technical Release

10, *Implementation Guidance on Asbestos Cleanup Costs Associated with Facilities and Installed Equipment*, NASA determined that completing site-specific inventories of asbestos, and gathering reliable cost estimates regarding the removal and disposal of asbestos, would cost an estimated $22 million for FY 2014 and FY 2013.

Note 10: Other Liabilities

Other Liabilities are comprised of intragovernmental liabilities and liabilities with public entities. Other Accrued Liabilities primarily consist of the accrual of contractor costs for goods and services. The period of performance for contractor contracts typically spans the duration of NASA programs, which could be for a number of years prior to final delivery of the product. In such cases, NASA records a cost accrual throughout the fiscal year as the work is performed.

Advances from Others primarily consists of payments received from other Federal agencies in advance of the performance of services under reimbursable agreements. Other Liabilities also includes Federal employee payroll and benefit liabilities, including unfunded annual leave and funded sick leave that has been earned but not taken, and salaries and wages that have been earned but are unpaid.

2014			
(In Millions of Dollars)	Current	Non-Current	Total
Intragovernmental Liabilities:			
Advances From Others	$ 56	$ —	$ 56
Workers' Compensation	5	6	11
Employer Contributions and Payroll Taxes	10	—	10
Liability for Non-Entity Assets	—	—	—
Other Accrued Liability	5	—	5
Total Intragovernmental	**76**	**6**	**82**
Unfunded Annual Leave	—	209	209
Accrued Funded Payroll	61	—	61
Advances from Others	90	—	90
Employer Contributions and Payroll Taxes	5	—	5
Liability for Deposit and Clearing Funds	5	—	5
Other Accrued Liabilities	1,185	—	1,185
Contingent Liabilites	—	36	36
Total Public	**1,346**	**245**	**1,591**
Total Other Liabilities	**$ 1,422**	**$ 251**	**$ 1,673**

2013			
(In Millions of Dollars)	Current	Non-Current	Total
Intragovernmental Liabilities:			
Advances From Others	$ 67	$ —	$ 67
Workers' Compensation	5	7	12
Employer Contributions and Payroll Taxes	9	—	9
Liability for Non-Entity Assets	1	—	1
Other Accrued Liability	3	—	3
Total Intragovernmental	**85**	**7**	**92**
Unfunded Annual Leave	—	205	205
Accrued Funded Payroll	51	—	51
Advances from Others	100	—	100
Employer Contributions and Payroll Taxes	5	—	5
Liability for Deposit and Clearing Funds	6	—	6
Other Accrued Liabilities	1,119	—	1,119
Contingent Liabilities	—	—	—
Total Public	**1,281**	**205**	**1,486**
Total Other Liabilities	**$ 1,366**	**$ 212**	**$ 1,578**

Note 11: Commitments and Contingencies

NASA is a party in various administrative proceedings, court actions (including tort suits), and claims. For cases which management and legal counsel believe it is probable that the outcomes will result in a loss to NASA, contingent liabilities are recorded. There were certain cases reviewed by legal counsel where the probable future loss is remote and as such no contingent liability has been recorded in connection with these cases.

There are certain other contracts which may contain provisions regarding contingent obligations to fund accumulated unfunded employee benefit plans upon contract termination. Currently, these potential liabilities are not measurable.

There is one case where the likelihood of loss is reasonably possible, with the loss estimated at $150 million for September 30, 2014.

There are cases in FY 2014 where the loss is probable, with the amount totaling $36 million.

(In Millions of Dollars)	2014	2013
Contingent Liabilities	$ 36	$ —
Total Contingent Liabilities	**$ 36**	**$ —**

Note 12: Intragovernmental Cost and Exchange Revenue

Intragovernmental costs and revenue are exchange transactions made between NASA and other Federal Government entities. Costs and revenue with the Public result from transactions between NASA and non-Federal entities.

(In Millions of Dollars)	2014	2013
Strategic Goal 1 – Expand the frontiers of knowledge, capability, and opportunity in space		
Intragovernmental Costs	$ 403	$ 418
Public Costs	11,385	11,078
Total Gross Costs	11,788	11,496
Less:		
Intragovernmental Earned Revenue	196	206
Public Earned Revenue	81	68
Total Earned Revenue	277	274
Net Cost	**$ 11,511**	**$ 11,222**
Strategic Goal 2 – Advance understanding of Earth and develop technologies to improve the quality of life on our home planet		
Intragovernmental Costs	$ 131	$ 147
Public Costs	3,515	3,516
Total Gross Costs	3,646	3,663
Less:		
Intragovernmental Earned Revenue	1,686	1,622
Public Earned Revenue	45	34
Total Earned Revenue	1,731	1,656
Net Cost	**$ 1,915**	**$ 2,007**
Strategic Goal 3 – Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure		
Intragovernmental Costs	$ 596	$ 558
Public Costs	4,299	4,502
Total Gross Costs	4,895	5,060
Less:		
Intragovernmental Earned Revenue	55	289
Public Earned Revenue	72	66
Total Earned Revenue	127	355
Net Cost	**$ 4,768**	**$ 4,705**
Net Cost of Operations	**$ 18,194**	**$ 17,934**

Note 13: Apportionment Categories of Obligations Incurred: Direct vs. Reimbursable Obligations

(In Millions of Dollars)	2014	2013
Direct Obligations:		
Category A	$ 1	$ 1
Category B	17,786	16,997
Reimbursable Obligations:		
Category B	2,566	2,713
Total Obligations Incurred	**$ 20,353**	**$ 19,711**

Category A consists of amounts requested to be apportioned annually and distributed for each calendar quarter in the fiscal year. Category B consists of amounts requested to be apportioned on a basis other than calendar quarters, such as time periods other than quarters, activities, projects, objects, or a combination thereof.

Note 14: Explanation of Differences Between the Statement of Budgetary Resources (SBR) and the Budget of the U.S. Government

The FY 2016 *Budget of the United States Government* (President's Budget), which presents the actual amounts for the year ended September 30, 2014, has not been published as of the issue date of these financial statements. On approval of the Administation, NASA will publish its FY 2016 President's Budget Request on the NASA Web site at:
http://www.nasa.gov/news/budget/

NASA reconciled the amounts of the FY 2013 column on the Statement of Budgetary Resources (SBR) to the actual amounts for FY 2013 in the FY 2015 President's Budget for budgetary resources, obligations incurred, distributed offsetting receipts, and net outlays as presented below.

(In Millions of Dollars)	Budgetary Resources	Obligations	Distributed Offsetting Receipts	Net Outlays
Combined Statement of Budgetary Resources	$ 20,755	$ 19,711	$ 13	$ 16,976
Included on SBR, not in President's Budget				
Expired Accounts	(198)	(75)	—	—
Distributed Offsetting Receipts	—	—	(13)	12
Budget of the United States Government	**$ 20,557**	**$ 19,636**	**$ —**	**$ 16,988**

The difference between the SBR and the President's Budget represents expired accounts and distributed offsetting receipts reported on the SBR but not in the President's Budget.

Note 15: Undelivered Orders at the End of the Period

Undelivered Orders represent the amount of goods and/or services ordered to perform NASA mission objectives, which have not been received. The total Undelivered Orders at the end of the period totaled $7.4 billion and $7.3 billion as of September 30, 2014 and September 30, 2013, respectively.

Note 16: Reconciliation of Net Cost to Budget

SFFAS No.7, *Accounting for Revenues and Other Financing Concepts for Reconciling Budgetary and Financial Accounting*, requires a reconciliation of proprietary and budgetary accounting information. Accrual-based measures used in the Statement of Net Cost differ from the obligation-based measures used in the Statement of Budgetary Resources. This reconciliation shows the relationship between the net obligations derived from the Statement of Budgetary Resources and net costs of operations derived from the Statement of Net Cost by identifying and explaining key items that affect one statement but not the other.

(In Millions of Dollars)	2014	2013
Resources Used to Finance Activities		
Budgetary Resources Obligated		
Obligations Incurred	$ 20,353	$ 19,711
Less: Spending Authority from Offsetting Collections and Recoveries	2,840	2,968
Obligations Net of Offsetting Collections and Recoveries	17,513	16,743
Less: Offsetting Receipts	—	—
Net Obligations	17,513	16,743
Other Resources		
Donations & Forfeitures of Property	7	3
Transfers In/Out Without Reimbursements	49	109
Imputed Financing from Costs Absorbed by Others	178	150
Net Other Resources Used to Finance Activities	234	262
Total Resources Used to Finance Activities	**17,747**	**17,005**
Resources Used to Finance Items Not Part of the Net Cost of Operations		
Change in Budgetary Resources Obligated for Goods, Services, and Benefits Ordered But Not Yet Provided	(205)	207
Resources that Fund Expenses Recognized in Prior Periods	(3)	(3)
Budgetary Offsetting Collections and Receipts that Do Not Affect the Net Resources that Finance the Acquisition of Assets	(1,104)	(1,155)
Other Resources or Adjustments to Net Obligated Resources that Do Not Affect Net Cost of Operations	(56)	(3)
Total Resources Used to Finance Items Not Part of the Net Cost of Operations	**(1,368)**	**(954)**
Total Resources Used to Finance the Net Cost of Operations	**$ 16,379**	**$ 16,051**
Components of Net Cost that Will Not Require or Generate Resources in the Current Period		
Components Requiring or Generating Resources in Future Periods		
Increases in Annual Leave Liability	$ 4	$ —
Increases in Environmental and Disposal Liability	31	74
Other	41	3
Total Components of Net Cost that Will Require or Generate Resources in Future Periods	76	77
Components Not Requiring or Generating Resources		
Depreciation	1,624	1,569
Revaluation of Assets or Liabilities	—	1
Other	115	236
Total Components of Net Cost of Operations that Will Not Require or Generate Resources	1,739	1,806
Total Components of Net Cost of Operations that Will Not Require or Generate Resources in the Current Period	**1,815**	**1,883**
Net Cost of Operations	**$ 18,194**	**$ 17,934**

Required Supplementary Stewardship Information

Stewardship Investments: Research and Development

NASA's strategic goals and outcomes are the basis of the Agency's performance framework and are executed to support its strategic plan. To provide a complete analysis of NASA costs, both Research and Development (R&D) and non-R&D costs are presented. Descriptions for the strategic goals and outcomes associated with these costs are also presented.

Research and Development Costs by Strategic Goal

(In Millions of Dollars)	2014	2013	2012	2011	2010
Research and Development Costs					
Basic					
Strategic Goal 1	$ 2,020	$ 1,728	$ 851	$ 827	$ 921
Strategic Goal 2	970	1,147	329	304	306
Strategic Goal 3	-	-	-	-	-
Total Basic Expenses	**$ 2,990**	**$ 2,875**	**$ 1,180**	**$ 1,131**	**$ 1,227**
Applied					
Strategic Goal 1	$ 1,828	$ 1,993	$ 1,561	$ 1,497	$ 2,027
Strategic Goal 2	578	597	480	467	505
Strategic Goal 3	6	-	-	-	-
Total Applied Expenses	**$ 2,412**	**$ 2,590**	**$ 2,041**	**$ 1,964**	**$ 2,532**
Development					
Strategic Goal 1	$ 4,980	$ 5,005	$ 3,023	$ 4,094	$ 4,936
Strategic Goal 2	434	177	608	665	536
Strategic Goal 3	8	33	-	-	-
Total Development Expenses	**$ 5,422**	**$ 5,215**	**$ 3,631**	**$ 4,759**	**$ 5,472**
Total Research and Development	**$ 10,824**	**$ 10,680**	**$ 6,852**	**$ 7,854**	**$ 9,231**
Non-Research and Development Cost					
Strategic Goal 1	$ 2,960	$ 2,770	$ 5,222	$ 5,907	$ 5,724
Strategic Goal 2	1,664	1,742	2,137	1,784	1,449
Strategic Goal 3	4,881	5,027	5,818	4,337	6,163
Total Non-Research and Development Expenses	**$ 9,505**	**$ 9,539**	**$ 13,177**	**$ 12,028**	**$ 13,336**
Total Expenses	**$ 20,329**	**$ 20,219**	**$ 20,029**	**$ 19,882**	**$ 22,567**

NASA makes substantial research and development investments for the benefit of the nation. These amounts are expensed as incurred in determining the gross cost of operations.

NASA's R&D programs include activities to extend our knowledge of Earth, its space environment, and the Universe, and to invest in new aeronautics and advanced space transportation technologies that support the development and application of technologies critical to the economic, scientific, and technical competitiveness of the United States.

Investment in R&D refers to those expenses incurred to support the search for new or refined knowledge and ideas and for the appli-

cation or use of such knowledge and ideas for the development of new or improved products and processes with the expectation of maintaining or increasing national economic productive capacity or yielding other future benefits.

Strategic Goals and Outcomes:

Strategic Goal 1: Expand the frontiers of knowledge, capability, and opportunity in space

Strategic Objective 1.1: Expand human presence into the solar system and to the surface of Mars to advance exploration, science, innovation, benefits to humanity, and international collaboration.

Major Programs Include:
- Orion Multi-Purpose Crew Vehicle Program
- Space Launch System (SLS) Program
- Exploration Ground Systems (EGS) Program
- Advanced Exploration Systems (AES)

Outcomes:
- Achieve critical milestones in development of new systems for the human exploration of deep space.

- Develop a new transportation system that includes a crew capsule, a heavy-lift launch vehicle, and supporting ground facilities and systems.

- Develop the technologies and capabilities for in-space propulsion, in-space operations, long-duration habitation, and other systems to support humans in hostile environments.

Strategic Objective 1.2: Conduct research on the International Space Station (ISS) to enable future space exploration, facilitate a commercial space economy, and advance the fundamental biological and physical sciences for the benefit of humanity.

Major Programs Include:
- International Space Station Program
- Human Research Program
- Human Space Flight Operations Program

Outcomes:
- Sustain the operation and full use of the International Space Station (ISS) and expand efforts to utilize the ISS as a National Laboratory for scientific, technological, diplomatic, and educational purposes and for supporting future objectives in human space exploration.

- Advance benefits to humanity through research.

- Enable a commercial demand-driven market in low Earth orbit (LEO).

- Enable long-duration human spaceflight beyond LEO.

- Provide a basis for international exploration partnerships.

Strategic Objective 1.3: Facilitate and utilize U.S. commercial capabilities to deliver cargo and crew to space.

Major Programs Include:
- Commercial Crew Program

Outcomes:
- U.S. commercial space transportation capabilities will provide safe, reliable, and cost effective access to and from LEO and the ISS for crew and cargo.

Strategic Objective 1.4: Understand the Sun and its interactions with Earth and the solar system, including space weather.

Major Programs Include:
- Heliophysics Research Program
- Living with a Star Program
- Solar Terrestrial Probes Program
- Heliophysics Explorer Program

Outcomes:
- Increased understanding of the heliosphere (the extended atmosphere of the Sun), including what causes the sun to vary, how do the geospace, planetary space environments, and the heliosphere respond, and what are the impacts on humanity.

Strategic Objective 1.5: Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.

Major Programs Include:
- Planetary Science Research Program
- Lunar Quest Program
- Discovery Program
- New Frontiers Program
- Mars Exploration Program
- Outer Planets Program
- Planetary Technology Program

Outcomes:
- Continue to expand knowledge of the solar system, seeking to answer fundamental questions: How did our solar system form and evolve? Is there life beyond Earth? What are the hazards to life on Earth?

Strategic Objective 1.6: Discover how the universe works, explore how it began and evolved, and search for life on planets around other stars.

Major Programs Include:
- Astrophysics Research Program
- Cosmic Origins Program
- Physics of the Cosmos Program
- Exoplanet Exploration Program
- Astrophysics Explorer Program
- James Webb Space Telescope (JWST)

Outcomes:
- Further understanding of the universe and how it works, its history, as well as the continued search for life beyond our Solar System.

Strategic Objective 1.7: Transform NASA missions and advance the Nation's capabilities by maturing crosscutting and innovative space technologies.

Major Programs Include:
- Crosscutting Space Technology Development (CSTD)
- Exploration Technology Development (ETD)
- Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR)

Outcomes:
- Develop new pioneering technologies, increasing the Nation's capability to perform space science, operate in space, and enable deep space exploration.

- Strengthen our Nation's leadership in space-related science, technology, and industrial base.

- Foster a technology-based U.S. economy.

Strategic Goal 2: Advance understanding of Earth and develop technologies to improve the quality of life on our home planet.

Strategic Objective 2.1: Enable a revolutionary transformation for safe and sustainable U.S. and global aviation by advancing aeronautics research.

Major Programs Include:
- Airspace Systems Program
- Aviation Safety Program
- Fundamental Aeronautics Program
- Integrated Systems Research Program.

Outcomes:
- Enable a revolutionary transformation of the aviation system to improve our quality of life and productivity on Earth.

- Contributes unique innovations to aviation through research activities. These innovations serve as key enablers for the role of U.S. commercial aviation in sustaining American commerce and safe, environmentally sustainable mobility, and hence the Nation's economic well-being.

Strategic Objective 2.2: Advance knowledge of Earth as a system to meet the challenges of environmental change, and to improve life on our planet.

Major Programs Include:
- Earth Science Research Program
- Earth Systematic Missions Program
- Earth System Science Pathfinders Program
- Earth Science Multi-Mission Operations Program
- Applied Sciences Program
- Earth Science Technology Program

Outcomes:
- NASA's Earth science programs shape an interdisciplinary view of Earth, exploring the interaction among the atmosphere, oceans, ice sheets, land surface interior, and life itself, which enables scientists to measure global and climate changes and to inform decisions by Government, organizations, and people.

Strategic Objective 2.3: Optimize Agency technology investments, foster open innovation, and facilitate technology infusion, ensuring the greatest National benefit.

Major Programs Include:
- Partnership Development and Strategic Integration

Outcomes:
- Optimization of NASA's technology portfolio.

- Enabling of critical technology development and open innovation.

- Maximized transfer of NASA technology to U.S. partners.

Strategic Objective 2.4: Advance the Nation's Science, Technology, Engineering, and Math (STEM) education and workforce pipeline by working collaboratively with other agencies to engage students, teachers and faculty in NASA's missions and unique assets.

Major Programs Include:
- Aerospace Research & Career Development Program
- STEM Education and Accountability Program

Outcomes:
- Federal agencies work together to im-

prove the quality of science, technology, engineering, and math (STEM) education in the United States.

- NASA will increase impact on the Nation's STEM education and workforce pipeline through the extension of STEM based internships, scholarships, and fellowships and the contribution of unique NASA mission and asset driven institution engagement, experiential learning, and professional development opportunities.

Strategic Goal 3: Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure.

Strategic Objective 3.1: Attract and advance a highly skilled, competent, and diverse workforce, cultivate an innovative work environment, and provide the facilities, tools, and services needed to conduct NASA's missions.

Major Programs Include:
- Center Management and Operations
- Agency Management
- Institutional Construction of Facilities (CoF)
- Environmental Compliance and Restoration

Outcomes:
- Effective management of human capital, finance, information technology, infrastructure, acquisitions, security, real and personal property, occupational health and safety, equal employment opportunity and diversity, small business programs, external relations, internal and external communications, stakeholder engagement, and other essential corporate functions.
- Sustainable management of NASA's infrastructure.
- NASA will have a diverse workforce infused with the spirit of innovation.

Strategic Objective 3.2: Ensure the availability and continued advance of strategic technical programmatic capabilities to sustain NASA's Mission.

Major Programs Include:
- Space Communications and Navigation (SCaN)
- Launch Services Program (LSP)
- Rocket Propulsion Testing (RPT)
- Programmatic Construction of Facilities
- Strategic Capabilities Assets Program (SCAP)

Outcomes:
- Key capabilities and critical assets will be available.

Strategic Objective 3.3: Provide secure, effective, and affordable information technologies and services that enable NASA's Mission.

Major Programs Include:
- Agency IT Services Program

Outcomes:
- IT enablement of NASA's mission and vision will be optimized.
- A seamless collaborative and mobile work environment that safeguards NASA's information assets will be created.

Strategic Objective 3.4: Ensure effective management of NASA programs and operations to complete the mission safely and successfully.

Major Programs Include:

- Office of the Chief Engineer (OCE)
- Office of Safety and Mission Assurance (OSMA)
- Office of the Chief Health and Medical Officer (OCHMO)

Outcomes:

- NASA will protect the health and safety of the NASA workforce.

- Safety and Mission Success will improve the likelihood that NASA's programs, projects, and operations are completed safely and successfully.

Required Supplementary Information

Combining Schedule of Budgetary Resources
For the Fiscal Year Ended September 30, 2014

(In Millions of Dollars)	Space Operations Mission	Science Mission	Exploration Mission	Aeronautics Mission	Cross-Agency Mission	Education Mission
Budgetary Resources:						
Unobligated Balance, Brought Forward, October 1	$ 170	$ 192	$ 53	$ 15	$ 300	$ 18
Recoveries of Prior Year Unpaid Obligations	115	74	45	8	38	5
Other Changes in Unobligated Balance	—	—	—	—	—	—
Unobligated Balance from Prior Year Budget Authority, Net	285	266	98	23	338	23
Appropriations	3,774	5,148	4,113	566	2,793	117
Spending Authority from Offsetting Collections	15	1	2	—	2,083	—
Total Budgetary Resources	**$ 4,074**	**$ 5,415**	**$ 4,213**	**$ 589**	**$ 5,214**	**$ 140**
Status of Budgetary Resources:						
Obligations Incurred	$ 3,878	$ 5,112	$ 4,098	$ 566	$ 4,982	$ 110
Unobligated Balance, End of Year:						
Apportioned	136	282	107	19	211	25
Unapportioned	60	21	8	4	21	5
Total Unobligated Balance, End of Period	196	303	115	23	232	30
Total Status of Budgetary Resources	**$ 4,074**	**$ 5,415**	**$ 4,213**	**$ 589**	**$ 5,214**	**$ 140**
Change in Obligated Balance:						
Unpaid Obligations:						
Unpaid Obligations, Brought Forward, October 1	$ 1,604	$ 3,030	$ 1,665	$ 231	$ 1,816	$ 164
Obligations Incurred	3,878	5,112	4,098	566	4,982	110
Outlays (Gross) (-)	(3,877)	(4,895)	(3,799)	(538)	(4,940)	(111)
Recoveries of Prior Year Unpaid Obligations (-)	(115)	(74)	(45)	(8)	(38)	(5)
Unpaid Obligations, End of Year	1,490	3,173	1,919	251	1,820	158
Uncollected payments:						
Uncollected Payments, Federal Sources, Brought Forward, October 1 (-)	—	—	—	—	(1,049)	—
Change in Uncollected Payments, Federal sources	—	—	—	—	61	—
Uncollected Payments, Federal Sources, End of Year (-)	—	—	—	—	(988)	—
Memorandum (Non-Add) Entries:						
Obligated Balance, Start of Year	**1,604**	**3,030**	**1,665**	**231**	**767**	**164**
Obligated Balance, End of Year	**$ 1,490**	**$ 3,173**	**$ 1,919**	**$ 251**	**$ 832**	**$ 158**
Budget Authority and Outlays, Net:						
Budget Authority, Gross	$ 3,789	$ 5,149	$ 4,115	$ 566	$ 4,876	$ 117
Actual Offsetting Collections (-)	(15)	(1)	(2)	—	(2,144)	—
Change in Uncollected Payments, Federal Sources	—	—	—	—	61	—
Budget Authority, Net	**3,774**	**5,148**	**4,113**	**566**	**2,793**	**117**
Outlays, Gross	3,877	4,895	3,799	538	4,940	111
Actual Offsetting Collections (-)	(15)	(1)	(2)	—	(2,144)	—
Outlays, Net	3,862	4,894	3,797	538	2,796	111
Distributed Offsetting Receipts (-)	—	—	—	—	—	—
Agency Outlays, Net	**$ 3,862**	**$ 4,894**	**$ 3,797**	**$ 538**	**$ 2,796**	**$ 111**

Combining Schedule of Budgetary Resources
For the Fiscal Year Ended September 30, 2014 (continued)

(In Millions of Dollars)	Office of Inspector General	American Recovery and Reinvestment Act	Space Technology Mission	Construction and Environmental Compliance and Restoration	Other	Total
Budgetary Resources:						
Unobligated Balance, Brought Forward, October 1	$ 4	$ 2	$ 12	$ 247	$ 31	$ 1,044
Recoveries of Prior Year Unpaid Obligations	—	2	14	20	18	339
Other Changes in Unobligated Balance	—	—	—	—	(27)	(27)
Unobligated Balance from Prior Year Budget Authority, Net	4	4	26	267	22	1,356
Appropriations	37	—	576	522	1	17,647
Spending Authority from Offsetting Collections	1	—	—	7	392	2,501
Total Budgetary Resources	**$ 42**	**$ 4**	**$ 602**	**$ 796**	**$ 415**	**$ 21,504**
Status of Budgetary Resources:						
Obligations Incurred	$ 38	$ 1	$ 580	$ 593	$ 395	$ 20,353
Unobligated Balance, End of Year:						
Apportioned	—	—	21	203	14	1,018
Unapportioned	4	3	1	—	6	133
Total Unobligated Balance, End of Period	4	3	22	203	20	1,151
Total Status of Budgetary Resources	**$ 42**	**$ 4**	**$ 602**	**$ 796**	**$ 415**	**$ 21,504**
Change in Obligated Balance:						
Unpaid Obligations:						
Unpaid Obligations, Brought Forward, October 1	$ 4	$ 10	$ 357	$ 723	$ 167	$ 9,771
Obligations Incurred	38	1	580	593	395	20,353
Outlays (Gross) (-)	(38)	—	(578)	(493)	(392)	(19,661)
Recoveries of Prior Year Unpaid Obligations (-)	—	(2)	(14)	(20)	(18)	(339)
Unpaid Obligations, End of Year	4	9	345	803	152	10,124
Uncollected payments:						
Uncollected Payments, Federal Sources, Brought Forward, October 1 (-)	—	—	—	—	(2)	(1,051)
Change in Uncollected Payments, Federal sources	—	—	—	—	2	63
Uncollected Payments, Federal Sources, End of Year (-)	—	—	—	—	—	(988)
Memorandum (Non-Add) Entries:						
Obligated Balance, Start of Year	**4**	**10**	**357**	**723**	**165**	**8,720**
Obligated Balance, End of Year	**$ 4**	**$ 9**	**$ 345**	**$ 803**	**$ 152**	**$ 9,136**
Budget Authority and Outlays, Net:						
Budget Authority, Gross	$ 38	$ —	$ 576	$ 529	$ 393	$ 20,148
Actual Offsetting Collections (-)	(1)	—	—	(7)	(394)	(2,564)
Change in Uncollected Payments, Federal Sources	—	—	—	—	2	63
Budget Authority, Net	**37**	**—**	**576**	**522**	**1**	**17,647**
Outlays, Gross	38	—	578	493	392	19,661
Actual Offsetting Collections (-)	(1)	—	—	(7)	(394)	(2,564)
Outlays, Net	37	—	578	486	(2)	17,097
Distributed Offsetting Receipts (-)	—	—	—	—	(5)	(5)
Agency Outlays, Net	**$ 37**	**$ —**	**$ 578**	**$ 486**	**$ (7)**	**$ 17,092**

Combining Schedule of Budgetary Resources
For the Fiscal Year Ended September 30, 2013

(In Millions of Dollars)	Space Operations Mission	Science Mission	Exploration Mission	Aeronautics Mission	Cross-Agency Mission	Education Mission
Budgetary Resources:						
Unobligated Balance, Brought Forward, October 1	$ 108	$ 73	$ 96	$ 18	$ 383	$ 21
Recoveries of Prior Year Unpaid Obligations	110	92	52	9	46	3
Other Changes in Unobligated Balance	—	—	—	—	—	—
Unobligated Balance from Prior Year Budget Authority, Net	218	165	148	27	429	24
Appropriations	3,725	4,781	3,705	530	2,711	116
Spending Authority from Offsetting Collections	4	1	2	—	2,211	—
Total Budgetary Resources	**$ 3,947**	**$ 4,947**	**$ 3,855**	**$ 557**	**$ 5,351**	**$ 140**
Status of Budgetary Resources:						
Obligations Incurred	$ 3,777	$ 4,755	$ 3,802	$ 542	$ 5,051	$ 122
Unobligated Balance, End of Year:						
Apportioned	99	178	47	13	283	15
Unapportioned	71	14	6	2	17	3
Total Unobligated Balance, End of Period	170	192	53	15	300	18
Total Status of Budgetary Resources	**$ 3,947**	**$ 4,947**	**$ 3,855**	**$ 557**	**$ 5,351**	**$ 140**
Change in Obligated Balance:						
Unpaid Obligations:						
Unpaid Obligations, Brought Forward, October 1	$ 1,756	$ 3,070	$ 1,946	$ 256	$ 2,086	$ 178
Obligations Incurred	3,777	4,755	3,802	542	5,051	122
Outlays (Gross) (-)	(3,819)	(4,703)	(4,030)	(558)	(5,274)	(133)
Recoveries of Prior Year Unpaid Obligations (-)	(110)	(92)	(52)	(9)	(46)	(3)
Unpaid Obligations, End of Year	1,604	3,030	1,666	231	1,817	164
Uncollected payments:						
Uncollected Payments, Federal Sources, Brought Forward, October 1 (-)	—	—	—	—	(1,314)	—
Change in Uncollected Payments, Federal sources	—	—	—	—	265	—
Uncollected Payments, Federal Sources, End of Year (-)	—	—	—	—	(1,049)	—
Memorandum (Non-Add) Entries:						
Obligated Balance, Start of Year	**1,756**	**3,070**	**1,946**	**256**	**772**	**178**
Obligated Balance, End of Year	**$ 1,604**	**$ 3,030**	**$ 1,666**	**$ 231**	**$ 768**	**$ 164**
Budget Authority and Outlays, Net:						
Budget Authority, Gross	$ 3,729	$ 4,782	$ 3,707	$ 530	$ 4,922	$ 116
Actual Offsetting Collections (-)	(4)	(1)	(2)	—	(2,475)	—
Change in Uncollected Payments, Federal Sources	—	—	—	—	265	—
Budget Authority, Net	**3,725**	**4,781**	**3,705**	**530**	**2,712**	**116**
Outlays, Gross	3,819	4,703	4,030	558	5,274	133
Actual Offsetting Collections (-)	(4)	(1)	(2)	—	(2,475)	—
Outlays, Net	3,815	4,702	4,028	558	2,799	133
Distributed Offsetting Receipts (-)	—	—	—	—	—	—
Agency Outlays, Net	**$ 3,815**	**$ 4,702**	**$ 4,028**	**$ 558**	**$ 2,799**	**$ 133**

Combining Schedule of Budgetary Resources
For the Fiscal Year Ended September 30, 2013 (continued)

(In Millions of Dollars)	Office of Inspector General	American Recovery and Reinvestment Act	Space Technology Mission	Construction and Environmental Compliance and Restoration	Other	Total
Budgetary Resources:						
Unobligated Balance, Brought Forward, October 1	$ 3	$ 2	$ 14	$ 172	$ 43	$ 933
Recoveries of Prior Year Unpaid Obligations	—	—	7	12	20	351
Other Changes in Unobligated Balance	—	—	—	—	(26)	(26)
Unobligated Balance from Prior Year Budget Authority, Net	3	2	21	184	37	1,258
Appropriations	36	—	614	661	1	16,880
Spending Authority from Offsetting Collections	1	—	—	3	395	2,617
Total Budgetary Resources	**$ 40**	**$ 2**	**$ 635**	**$ 848**	**$ 433**	**$ 20,755**
Status of Budgetary Resources:						
Obligations Incurred	$ 36	$ —	$ 623	$ 601	$ 402	$ 19,711
Unobligated Balance, End of Year:						
Apportioned	1	—	11	246	10	903
Unapportioned	3	2	1	1	21	141
Total Unobligated Balance, End of Period	4	2	12	247	31	1,044
Total Status of Budgetary Resources	**$ 40**	**$ 2**	**$ 635**	**$ 848**	**$ 433**	**$ 20,755**
Change in Obligated Balance:						
Unpaid Obligations:						
Unpaid Obligations, Brought Forward, October 1	$ 5	$ 11	$ 292	$ 511	$ 173	$ 10,284
Obligations Incurred	36	—	623	601	402	19,711
Outlays (Gross) (-)	(37)	(1)	(552)	(377)	(389)	(19,873)
Recoveries of Prior Year Unpaid Obligations (-)	—	—	(7)	(12)	(20)	(351)
Unpaid Obligations, End of Year	4	10	356	723	166	9,771
Uncollected payments:						
Uncollected Payments, Federal Sources, Brought Forward, October 1 (-)	—	—	—	—	(4)	(1,318)
Change in Uncollected Payments, Federal sources	—	—	—	—	2	267
Uncollected Payments, Federal Sources, End of Year (-)	—	—	—	—	(2)	(1,051)
Memorandum (Non-Add) Entries:						
Obligated Balance, Start of Year	**5**	**11**	**292**	**511**	**169**	**8,966**
Obligated Balance, End of Year	**$ 4**	**$ 10**	**$ 356**	**$ 723**	**$ 164**	**$ 8,720**
Budget Authority and Outlays, Net:						
Budget Authority, Gross	$ 37	$ —	$ 614	$ 664	$ 396	$ 19,497
Actual Offsetting Collections (-)	(1)	—	—	(3)	(398)	(2,884)
Change in Uncollected Payments, Federal Sources	—	—	—	—	2	267
Budget Authority, Net	**36**	**—**	**614**	**661**	**—**	**16,880**
Outlays, Gross	37	1	552	377	389	19,873
Actual Offsetting Collections (-)	(1)	—	—	(3)	(398)	(2,884)
Outlays, Net	36	1	552	374	(9)	16,989
Distributed Offsetting Receipts (-)	—	—	—	—	(13)	(13)
Agency Outlays, Net	**$ 36**	**$ 1**	**$ 552**	**$ 374**	**$ (22)**	**$ 16,976**

Deferred Maintenance and Repairs For the Fiscal Years 2014 and 2013

Deferred maintenance and repairs are maintenance and repair activities not performed when they should have been or were scheduled to be and which, therefore, are put off or delayed for a future period. NASA's buildings, facilities and other structures which include heritage assets remain in fair to good condition. Heritage assets support NASA's mission and enhance the public's understanding of NASA's numerous programs.

NASA uses a Deferred Maintenance parametric estimating method (DM method) in order to conduct a consistent condition assessment of its facilities, buildings and other structures (including heritage assets). This method measures NASA's current real property asset condition and documents real property deterioration. The DM method produces both a cost estimate of deferred maintenance and repairs, and a Facility Condition Index (FCI). Both measures are indicators of the overall condition of NASA's facilities. The facilities condition assessment methodology involves an independent, rapid visual assessment of nine different systems within each facility to include: structure, roof, exterior, interior finishes, HVAC, electrical, plumbing, conveyance, and program support equipment. The DM method is designed for application to a large population of facilities; results are not necessarily applicable for individual facilities or small populations of facilities. Under this methodology, NASA defines acceptable operating conditions in accordance with standards comparable to those used in private industry and the aerospace industry.

There has been no significant change in our deferred maintenance and repair estimate this year. The FCI is rated on a scale from 5 (excellent) to 1 (non-functional). The Agency-wide FCI, based on the ratings obtained during the condition assessment site visits, remains unchanged from the previous fiscal year. The FCI values for the majority of individual Centers and sites varied less than 0.5, validating the relative stability of the Centers and sites despite the continued aging and deterioration of older facilities. Evaluation of the facility conditions by building type (Real Property Classification Code/ DM Category) indicates that the Agency continues to focus maintenance and repair on direct mission-related facilities. Higher condition ratings are reported for Launch Facilities, potable water facilities, launch, communication, tracking, and fuel facilities Agency wide. Lower condition ratings occur for infrastructure, site-related systems, and static test stands.

Deferred Maintenance Method	2014	2013
Facility Condition Index (FCI)	3.7	3.7
Target Facility Index	3.8	3.8
Deferred Maintenance Estimate (Active and Inactive Assets) *(In Millions of Dollars)*	$ 2,353	$ 2,295

NASA OFFICE OF INSPECTOR GENERAL

SUITE 8U37, 300 E ST SW
WASHINGTON, D.C. 20546-0001

November 14, 2014

TO: Charles F. Bolden, Jr.
Administrator

David P. Radzanowski
Chief Financial Officer

SUBJECT: *Audit of the National Aeronautics and Space Administration's Fiscal Year 2014 Financial Statements* (Report No. IG-15-006; Assignment No. A-14-009-00)

Dear Administrator Bolden and Mr. Radzanowski,

The Office of Inspector General contracted with the independent public accounting firm PricewaterhouseCoopers LLP (PwC) to audit NASA's fiscal year (FY) 2014 financial statements. PwC performed the audit in accordance with the Government Accountability Office's (GAO) *Government Auditing Standards* and the Office of Management and Budget's Bulletin No. 14-02, "Audit Requirements for Federal Financial Statements."

The audit resulted in an unmodified opinion on NASA's FY 2014 financial statements (Enclosure 1). An unmodified opinion means the financial statements present fairly, in all material respects, the financial position and the results of NASA's operations in conformity with U.S. generally accepted accounting principles.

PwC also issued reports on NASA's internal control and compliance with laws and regulations (Enclosures 2 and 3, respectively). PwC reported no material weaknesses or significant deficiencies in internal control and identified no instances of significant noncompliance with applicable laws and regulations.

We monitored the progress of the audit, reviewed PwC's reports and related documentation, inquired of PwC's representatives, and ensured PwC met contractual requirements. Our review was not intended to enable us to express and we do not express an opinion on NASA's financial statements, conclusions about the effectiveness of internal controls over financial reporting, or conclusions on compliance with certain laws and regulations, including but not limited to the Federal Financial Management Improvement Act of 1996.

PwC is responsible for each of the enclosed reports and the conclusions expressed therein. Our review disclosed no instances where PwC did not comply in all material respects with GAO's *Government Auditing Standards.*

We appreciate the courtesies extended during the audit. Please contact Jim Morrison, Assistant Inspector General for Audits, if you have any questions about the enclosed reports.

Sincerely,

Paul K. Martin
Inspector General

Enclosures

Independent Auditor's Report

To the Administrator and the Inspector General
of the National Aeronautics and Space Administration

Report on the Financial Statements

We have audited the accompanying financial statements of the National Aeronautics and Space Administration (NASA) which comprise the consolidated balance sheets as of September 30, 2014 and September 30, 2013, and the related consolidated statements of net cost and changes in net position, and the combined statements of budgetary resources, and the related notes to the financial statements for the years then ended, which collectively comprise NASA's financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on the financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America, the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States, and Office of Management and Budget (OMB) Bulletin No. 14-02, *Audit Requirements for Federal Financial Statements*. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

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Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of NASA as of September 30, 2014 and September 30, 2013, and its net cost, changes in net position and budgetary resources for the years then ended, in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information and Required Supplementary Stewardship Information

Accounting principles generally accepted in the United States of America require that the accompanying *Management's Discussion and Analysis* (MD&A); *Required Supplementary Information* (RSI); and, *Required Supplementary Stewardship Information* (RSSI) be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Federal Accounting Standards Advisory Board and OMB Circular A-136, *Financial Reporting Requirements*, who considers it to be an essential part of financial reporting for placing the basic financial statements in the appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we have obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audit was conducted for the purpose of forming an opinion on the financial statements as a whole. The *Message from the Administrator* and *Other Information* is presented for purposes of additional analysis and is not a required part of the financial statements. Such information has not been subjected to the auditing procedures applied in the audit of the financial statements and, accordingly, we do not express an opinion or provide any assurance on the information.

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Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated November 14, 2014 on our consideration of NASA's internal control over financial reporting and our report dated November 14, 2014, on its compliance and other matters for the year ended September 30, 2014. The purpose of those reports is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. Those reports are an integral part of an audit performed in accordance with *Government Auditing Standards* in considering NASA's internal control over financial reporting and compliance.

PricewaterhouseCoopers LLP

McLean, VA
November 14, 2014

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Independent Auditor's Report on Internal Control Over Financial Reporting Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

To the Administrator and Inspector General
of the National Aeronautics and Space Administration

We have audited, in accordance with auditing standards generally accepted in the United States of America, the standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States, and Office of Management and Budget (OMB) Bulletin No. 14-02, *Audit Requirements for Federal Financial Statements,* the financial statements of the National Aeronautics and Space Administration (NASA), which comprise the consolidated balance sheet as of September 30, 2014, and the related consolidated statements of net cost and changes in net position, and the combined statement of budgetary resources and the related notes to the financial statements for the year then ended, which collectively comprise NASA's financial statements, and have issued our report thereon dated November 14, 2014.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered NASA's internal control over financial reporting ("internal control") to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of NASA's internal control. Accordingly, we do not express an opinion on the effectiveness of NASA's internal control.

We limited our control testing to those controls necessary to achieve the following OMB control objectives that provide reasonable, but not absolute assurance, that: (1) transactions are properly recorded, processed, and summarized to permit the preparation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and assets are safeguarded against loss from unauthorized acquisition, use, or disposition; and (2) transactions are executed in compliance with laws governing the use of budget authority, government-wide policies and laws identified in Appendix E of OMB Bulletin No. 14-02, and other laws and regulations, contracts, and grant agreements that could have a direct and material effect on the financial statements.

We did not test all internal controls relevant to the operating objectives broadly defined by the Federal Managers' Financial Integrity Act of 1982.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented,

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or detected and corrected on a timely basis. A *significant deficiency* is a deficiency or a combination of deficiencies in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control. Accordingly, this communication is not suitable for any other purpose.

PricewaterhouseCoopers LLP

McLean, VA
November 14, 2014

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Independent Auditor's Report on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

To the Administrator and the Inspector General
of the National Aeronautics and Space Administration

We have audited, in accordance with auditing standards generally accepted in the United States of America, the standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States, and Office of Management and Budget (OMB) Bulletin No. 14-02, *Audit Requirements for Federal Financial Statements,* the financial statements of the National Aeronautics and Space Administration (NASA), which comprise the consolidated balance sheet as of September 30, 2014, and the related consolidated statements of net cost and changes in net position, and the combined statement of budgetary resources and the related notes to the financial statements for the year then ended, which collectively comprise NASA's financial statements, and have issued our report thereon dated November 14, 2014.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether NASA's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, including laws governing the use of budgetary authority, government-wide policies and laws identified in Appendix E of OMB Bulletin No. 14-02 and other laws and regulations, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. Under the Federal Financial Management Improvement Act of 1996 (FFMIA), we are required to report whether NASA's financial management systems substantially comply with the Federal financial management systems requirements, applicable Federal accounting standards, and the United States Government Standard General Ledger at the transaction level. To meet this requirement, we performed tests of compliance with FFMIA section 803(a) requirements.

We limited our tests of compliance to the provisions of the laws, regulations, contracts, and grant agreements cited above; however providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion.

The results of our tests of compliance disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards* or OMB Bulletin No. 14-02 and no instances of substantial noncompliance that are required to be reported under FFMIA.

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Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of compliance and the results of that testing, and not to provide an opinion on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's compliance. Accordingly, this communication is not suitable for any other purpose.

PricewaterhouseCoopers LLP

McLean, VA
November 14, 2014

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Other Information

Image Caption: Night Before Launch of Mars-Bound MAVEN Spacecraft. (Credit: NASA/ Bill Ingalls)

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NASA OFFICE OF INSPECTOR GENERAL

SUITE 8U37, 300 E ST SW
WASHINGTON, D.C. 20546-0001

November 14, 2014

TO: Charles F. Bolden, Jr.
Administrator

SUBJECT: *2014 Report on NASA's Top Management and Performance Challenges*

Dear Administrator Bolden,

As required by the Reports Consolidation Act of 2000, this memorandum provides our views of the top management and performance challenges facing NASA for inclusion in its fiscal year (FY) 2014 Agency Financial Report.

In deciding whether to identify an issue as a top challenge, we considered its significance in relation to the Agency's mission; its susceptibility to fraud, waste, and abuse; whether the underlying causes are systemic in nature; and the Agency's progress in addressing the challenge. We previously provided a draft copy of our views to NASA officials and considered all comments received when finalizing this report. Management comments can be found in Appendix A of the enclosure.

Looking forward to 2015, we identified the following as the top management and performance challenges facing NASA:

- Managing NASA's Human Space Exploration Programs: the International Space Station, Commercial Crew Transportation, and the Space Launch System
- Managing NASA's Science Portfolio
- Ensuring Continued Efficacy of the Space Communications Networks
- Overhauling NASA's Information Technology Governance Structure
- Ensuring the Security of NASA's Information Technology Systems
- Managing NASA's Infrastructure and Facilities
- Ensuring the Integrity of the Contracting and Grants Processes and the Proper Use of Space Act Agreements

The late October failure of a cargo resupply mission to the International Space Station underscores the difficulty of spaceflight and increases the challenges associated with NASA's approach to using commercial partners to resupply the Station.

Similar to last year, we noted that declining budgets and fiscal uncertainties have compounded the difficulty of meeting these and other NASA challenges. Finally, during FY 2015 the NASA Office of Inspector General will conduct audit and investigative work that focuses on NASA's continuing efforts to meet these challenges. Please contact Jim Morrison, Assistant Inspector General for Audits, if you have any questions.

Sincerely,

Paul K. Martin
Inspector General

cc: Robert Lightfoot
Associate Administrator

Lesa Roe
Deputy Associate Administrator

Michael French
Chief of Staff

Richard Keegan
Associate Deputy Administrator

Enclosure – 1

NASA's Top Management and Performance Challenges, November 2014

NASA's ability to sustain its ambitious exploration, science, and aeronautics programs will be driven in large measure by whether the Agency is able to adequately fund such high-profile initiatives as its commercial cargo and crew programs, the Space Launch System (SLS) rocket and Orion capsule, James Webb Space Telescope, Mars 2020 Rover, and the personnel and infrastructure associated with these and other missions. Over the past year, the Office of Inspector General (OIG) voiced concerns on a variety of issues that could affect the sustainability of NASA's varied missions. For example:

- Because of budget reductions and the loss of other expected revenue, NASA's Space Network – part of the Agency's Space Communications and Navigation Program that provides connectivity with NASA spacecraft operating in low Earth orbit – will not have sufficient funding beginning in fiscal year (FY) 2016 to meet all planned service commitments.[1]
- Since 2006, NASA has spent or budgeted an average of $62 million annually to address an estimated $1.1 billion in unfunded environmental liabilities. Soil and groundwater cleanup costs for one project alone – the Santa Susana Field Laboratory outside Los Angeles, California – could easily consume NASA's entire environmental restoration budget.[2]

The Government Accountability Office (GAO) echoed concerns about sustainability in its July 2014 audit of the SLS Program in which it found that although NASA is making "solid progress" on the rocket's design, it has not developed "an executable business case . . . that matches resources to requirements."[3] Similarly, during its July 2014 meeting several NASA Advisory Council (NAC) members raised concerns that the Agency's human spaceflight program, including the Asteroid Redirect Mission and a human visit to Mars, is not executable within the Agency's anticipated funding levels: "the mismatch between NASA's aspirations for human spaceflight and its budget for human spaceflight is the most serious problem facing the agency."[4] Finally, a National Research Council committee examining how NASA can develop a sustainable program of human deep space exploration noted in its June 2014 report that "progress in human space exploration beyond low Earth orbit will be measured in decades and hundreds of billions of dollars" and concluded that "any human exploration program will only succeed if it is appropriately funded and receives a sustained commitment on the part of those who govern our nation."[5]

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[1] NASA OIG, "Space Communications and Navigation: NASA's Management of the Space Network" (IG-14-018, April 29, 2014).

[2] NASA OIG, "Audit of NASA's Environmental Restoration Efforts" (IG-14-021, July 2, 2014).

[3] GAO, "Space Launch System: Resources Need to be Matched to Requirements to Decrease Risk and Support Long Term Affordability" (GAO-14-631, July 23, 2014).

[4] Dr. Steven W. Squyres, Chair, NAC, letter to Charles F. Bolden Jr., Administrator, NASA, August 4, 2014, http://www.nasa.gov/sites/default/files/files/SquyresLetterToBolden_tagged.pdf (accessed September 15, 2014). The NAC is an outside group of experts that advises the NASA Administrator on major issues affecting the Agency.

[5] National Research Council, "Pathways to Exploration – Rationales and Approaches for a U.S. Program of Human Space Exploration," Washington, D.C., National Academies Press (2014).

NASA began the new fiscal year without a full-year appropriation and faces significant budgetary challenges given that its "top-line" funding level is likely to remain relatively flat for at least the next several years. Accordingly, we believe the principal challenge facing NASA leaders in FY 2015 will be to effectively manage the Agency's varied programs in an uncertain budget environment. In addition to this overarching challenge, NASA managers must address a myriad of individual Agency-, project-, and facility-related challenges. This report provides our views of the seven top management and performance challenges facing the Agency:

- Managing NASA's Human Space Exploration Programs: the International Space Station, Commercial Crew Transportation, and the Space Launch System
- Managing NASA's Science Portfolio
- Ensuring the Continued Efficacy of the Space Communications Networks
- Overhauling NASA's Information Technology Governance
- Ensuring the Security of NASA's Information Technology Systems
- Managing NASA's Infrastructure and Facilities
- Ensuring the Integrity of the Contracting and Grants Processes and Proper Use of Space Act Agreements

In deciding whether to identify an issue as a top challenge, we considered the significance of the challenge in relation to NASA's mission; whether its underlying causes are systemic in nature; the challenge's susceptibility to fraud, waste, and abuse; and the Agency's progress in addressing the challenge. We have not listed the challenges in priority order.

Managing NASA's Human Space Exploration Programs

NASA is simultaneously managing three large-scale, long-term human exploration programs – the International Space Station (ISS or Station); development of a capability through private, domestic spaceflight companies to transport astronauts to the ISS in an effort known as the Commercial Crew Program; and the SLS, Orion, and Ground Systems Development and Operations (GSDO) Programs. Looming over the daunting technical and schedule challenges associated with these Programs is a constrained budget and evolving political environment.

Extending the International Space Station

In November 2013, the ISS completed 15 years of continuous operation in low Earth orbit, marking a significant achievement in the history of human spaceflight. Two months later, the Administration announced its intent to extend Station operations from the current target of 2020 to 2024. As a result, a spacecraft originally designed and tested for a 15-year life span may now operate for 26 years. (See Figure 1.)

Figure 1: International Space Station

Source: NASA.

Since 1994, the United States has invested almost $75 billion in the ISS for construction, operating costs, and transportation, and NASA will continue to spend at least $3 to $4 billion per year to maintain and operate the Station going forward.[6] Historically, the Agency's international partners – the European Space Agency, Canada, Japan, and Russia – have contributed to ISS operations and helped share associated expenses by providing astronauts, ground facilities, launch vehicles, and other items and services, but the level of international participation beyond 2020 is uncertain.[7]

In the meantime, NASA continues to utilize the ISS as a research platform to study and mitigate a variety of human health risks that must be addressed to enable long-term human exploration missions. However, a major portion of the Station's success as a research platform hinges on the ability of NASA's partner – the Center for the Advancement of Science in Space (CASIS) – to attract sufficient interest and funding from private users and investors.

In a September 2014 report assessing NASA's examination of the issues related to extending the ISS to 2024, we found that while NASA has identified no major obstacles, it must address several areas of risk.[8] First, the ISS may experience insufficient power generation due, in part, to faster-than-expected degradation of its solar arrays. Second, sporadic failures of key hardware have required unplanned spacewalks for repairs. Finally, NASA has a limited ability to transport large replacement parts to the ISS should they be needed.

NASA officials have indicated they intend to maintain the ISS budget between $3 and $4 billion per year through 2024. In our judgment, this estimate is based on overly optimistic assumptions and we believe the cost to NASA will likely be higher. First, much of the projected cost increase is attributable to increased transportation costs, but we found NASA's estimate for transportation costs unrealistic. Specifically, NASA's estimates for the cost of the commercial crew transportation services are based on the cost of a Soyuz seat in FY 2016 – $70.7 million per seat for a total cost of $283 million per mission for

[6] This figure does not include development costs incurred under the cancelled Space Station Freedom program.

[7] NASA expects each Partner to make a decision about their continued participation and role in ISS by the end of 2016.

[8] NASA OIG, "Extending the Operational Life of the International Space Station Until 2024" (IG-14-031, September 18, 2014).

four astronauts. However, the Program's independent Government cost estimates project significantly higher costs when NASA purchases flights from commercial companies rather than from Russia. Second, the Agency's international partners have yet to commit to participating in Station operations beyond 2020. Should one or more decide not to, NASA and any remaining partners will likely face higher costs. While ISS Program officials said they are seeking to reduce costs, it is unclear whether these efforts will be sufficient to address anticipated cost increases.

Given the high cost and extraordinary effort to build the ISS, national leaders have emphasized the importance of maximizing its scientific research capabilities. However, we found that while utilization of the ISS for research is increasing, NASA and CASIS continue to face challenges. A significant amount of research aboard the ISS is related to the risks associated with long-term human presence in space; however, by 2024 NASA expects research aboard the Station to result in mitigation strategies for only 12 of the 23 human health risks for which the ISS is an appropriate research platform. Although ground-based methods could be used to develop risk-mitigation procedures, such methods are not ideal. Therefore, NASA needs to prioritize research aboard the ISS to address the most important risks before Station operations end. In April 2014, we opened an audit to examine NASA's efforts to manage health and human performance risks associated with long-duration space exploration more closely.

In August 2011, NASA signed a cooperative agreement with CASIS to manage non-NASA research aboard the ISS. Pursuant to the agreement, NASA provides CASIS with $15 million annually to fund non-NASA research proposals. Further progress on expanding ISS research depends on CASIS's ability to attract private funding and encourage companies and other organizations to conduct self-funded research. Moreover, our September 2014 ISS audit found that attracting more commercial researchers would require gaining legislative approval for them to retain intellectual property rights in the research.

Another key facet to maximizing research on the Station is providing a U.S. capability to transport cargo and crew. Two commercial providers – Space Exploration Technologies Corporation (SpaceX) and Orbital Sciences Corporation (Orbital) – are scheduled to continue making cargo deliveries to the ISS through 2017, and competition will soon begin for a new cargo resupply contract. NASA's challenge will be procuring enough flights to the Station at an affordable price to support ISS research.

In late October 2014, Orbital's third resupply mission failed shortly after launch from NASA's Wallops Flight Facility in Virginia, destroying an Antares rocket and Cygnus spacecraft loaded with 4,800 pounds of science and research, crew supplies, and vehicle hardware bound for the ISS. As a result, NASA will need to reexamine its cargo manifest and make any necessary adjustments to upcoming SpaceX resupply missions and work with Orbital to repair the Wallops facility and identify a root case of the mishap to ensure a safe return-to-flight for the company's vehicles.

Securing Commercial Transportation for Astronauts to Low Earth Orbit

Since the end of the Space Shuttle Program in 2011, the United States has lacked a domestic capability to transport astronauts to the ISS. Between 2012 and 2017, NASA will pay Russia $1.7 billion to ferry 30 NASA astronauts and international partners to and from the Station at prices ranging from $47 million to more than $70 million per round trip. To address this lack of U.S. capacity, NASA has provided approximately $1.6 billion in funding since 2010 to U.S. commercial spaceflight companies to spur development of a crew transportation capability. NASA originally hoped commercial flights would be operating by 2016, but due to funding constraints, the Agency adjusted this goal to late 2017.

NASA is closing out the third phase of the Commercial Crew Program's development in which it worked with three companies – The Boeing Company (Boeing), SpaceX, and Sierra Nevada Corporation (Sierra Nevada) – using a combination of funded Space Act Agreements and more traditional contracts to develop commercial crew transportation capabilities. Boeing completed its Critical Design Review for its system in August 2014, while the remaining two companies expect to complete their reviews by March 2015.[9] A fourth company, Blue Origin, is also conducting developmental work under an unfunded Space Act Agreement.

The fourth and final phase of NASA's Commercial Crew Program began in September 2014 with the award of $6.8 billion in firm-fixed-price contracts to Boeing ($4.2 billion) and SpaceX ($2.6 billion), to complete development of and certification for operation of their spaceflight systems and for up to six flights to the Station.[10] In these contracts, NASA will provide Boeing and SpaceX with specific requirements for launch systems, spacecraft, and related ground support. The contracts include at least one crewed flight test with a NASA astronaut to verify that the fully integrated rocket and spacecraft system can launch, maneuver in orbit, and dock to the ISS, as well as validate that all systems are performing as expected. Once each company's test program has been successfully completed and its system certified, they will conduct at least two, and as many as six, crewed missions to the Station. The spacecraft also will serve as a lifeboat for astronauts aboard the Station.

In 2012, NASA planned to transition from Space Act Agreements to firm-fixed-price contracts governed by the Federal Acquisition Regulation (FAR) for final design work, testing, evaluation, and certification of crew transportation systems. Thereafter, NASA planned to enter into individual FAR-based contracts to acquire specific transportation services. However, in FY 2012 NASA received only $397 million for its Commercial Crew Program, less than half of its $850 million request. As a result, NASA revised its acquisition strategy and continued to rely on funded Space Act Agreements for the integrated design phase of the Commercial Crew Program rather than FAR-based contracts. This situation was further exacerbated in 2013 when the Program again received significantly less than requested – $525 million compared to the $830 million requested. Although the Commercial Crew Program received $696 million out of $821 million requested in FY 2014, funding shortfalls in previous years contributed to delaying the expected completion date of the Program's development phase from 2016 to 2017.

NASA's use of funded Space Act Agreements rather than FAR-based contracts to develop new crew and cargo transportation capabilities has had several benefits.[11] First, because the partners share development costs and Space Act Agreements involve fewer regulations and require less oversight by NASA, the Agency spent less to develop these capabilities. For example, in the cargo development program, NASA estimated it saved between $1.4 and $4 billion in connection with SpaceX's efforts, with similar savings for the transportation obtained from Orbital. Second, because NASA does not impose

[9] Each company defined its own requirements for achieving Preliminary and Critical Design Reviews that were negotiated with NASA before the Space Act Agreements were awarded. NASA defines a Preliminary Design Review as establishing the basis for proceeding with detailed design and demonstrating that the correct design option was selected, interfaces have been identified, and verification methods have been described. The Critical Design Review determines if the integrated design is appropriately mature to continue with final design and fabrication. Both reviews are important to demonstrate that a system meets all requirements with acceptable risk and within cost and schedule constraints. NASA funded Boeing and SpaceX to achieve Critical Design Review, but due to the Agency's limited budget did not fund Sierra Nevada's completion of that milestone.

[10] One bidder NASA did not select for a contract award, Sierra Nevada, filed a protest with the GAO in September 2014. Although the protest had not been resolved at the time this report was issued, NASA invoked an exception to the automatic stay that generally follows such a protest and directed Boeing and SpaceX to begin work on the contracts.

[11] NASA, "Commercial Orbital Transportation Services: A New Era in Spaceflight" (NASA/SP-2014-617, February 2014).

specific requirements on the companies as part of the Space Act Agreements, the commercial partners are free to develop spacecraft designs that will support the needs of both NASA and other customers. Finally, NASA officials said they believe the greater flexibility offered by the Space Act Agreements promotes creativity and innovation.

However, NASA's decision to limit specific design and safety requirements during the development process also poses risks and makes it harder to ensure the companies will ultimately produce spaceflight systems that can safely carry humans to and from the ISS. To mitigate these concerns, in December 2011 NASA published documents identifying the requirements and certification process for commercial transportation systems. A year later, NASA began the certification process by awarding Boeing, SpaceX, and Sierra Nevada FAR-based contracts that require them to submit key documents for NASA's review and approval. However, because they had completed much of their spacecraft design work prior to award of these contracts, Boeing, SpaceX, and Sierra Nevada expressed concern that NASA's feedback may not be timely and could cause schedule delays or increased costs if design changes are required to meet Agency requirements. Although the use of Space Act Agreements in the Commercial Crew Program is ending, we concluded in a June 2014 audit that NASA may have more flexibility than the Agency originally thought in defining requirements.[12] Specifically, allowing program managers to describe detailed program objectives and key safety elements would help ensure the money NASA invests in these development projects produces technology that will meet Agency needs.

In a November 2013 audit report, we identified four challenges to NASA's Commercial Crew Program: (1) unstable funding, (2) integration of cost estimates with the Program schedule, (3) providing timely requirement and certification guidance, and (4) spaceflight coordination issues with other Federal agencies.[13] Since that time, the Agency has made some progress in these areas and expects to complete corrective actions by mid-2015.

Developing the Space Launch System, Orion, and Ground Systems Development and Operations Programs

NASA continues to describe its long-term human exploration goal as sending humans to Mars and is planning for a precursor mission to identify, capture, and relocate an asteroid. However, some members of the Agency's congressional oversight committees are advocating for a Moon landing mission to prepare for a trip to Mars. Whatever the destination, successful development of NASA's new heavy lift rocket, the SLS; the accompanying Orion crew capsule; and related launch infrastructure remain critical to the overall success of NASA's human exploration goals.

The NASA Authorization Act of 2010 set a goal for NASA to achieve operational capability for the SLS and Orion by December 31, 2016; however, NASA has reported that it will not meet this timetable.[14] Initially, the Agency scheduled an un-crewed test flight for December 2017, and is still working toward that goal; however, noting technical and funding uncertainties during a recent SLS design review, NASA adjusted its planning schedule to reflect a launch readiness date of no later than November 2018.

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[12] NASA OIG, "NASA's Use of Space Act Agreements" (IG-14-020, June 5, 2014).

[13] NASA OIG, "NASA's Management of the Commercial Crew Program" (IG-14-001, November 13, 2013).

[14] The National Aeronautics and Space Administration Authorization Act of 2010, Pub. L. No. 111-267, 124 Stat. 2805.

Figure 2: Artist Concept of Space Launch System

Source: NASA.

NASA is using the Space Shuttle's main engine, the RS-25, on the SLS and designing the vehicle with an evolvable architecture that can be tailored to accommodate longer and more ambitious missions. Initial versions of the SLS will be capable of lifting 70-metric tons and use an interim cryogenic propulsion stage to propel Orion around the Moon on its first exploration mission. Later versions will be designed to lift 130-metric tons and incorporate an upper stage to travel to deep space. Orion will be mounted atop the SLS and serve as the crew vehicle for up to six astronauts. NASA is developing the capsule using an existing contract with Lockheed Martin Corporation and is basing its design on requirements for the crew exploration vehicle that was part of NASA's now defunct Constellation Program. (See Figure 2.)

In addition to the SLS and Orion, NASA's GSDO Program is modifying launch infrastructure at Kennedy Space Center that was formerly used for the Space Shuttle. To support the SLS, the GSDO Program is refurbishing the crawler-transporter that will transport the SLS from the Center's Vehicle Assembly Building to the launch pad and modifying the mobile launcher and tower (originally built for the Constellation Program's Ares I rocket), the Vehicle Assembly Building, and Launch Pad 39B. We are in the final stages of an audit of the GSDO Program.

NASA's challenge in this area continues to be managing the concurrent development of a launch system and crew vehicle and modifying the necessary supporting ground systems while also meeting the Administrator's mandate that exploration systems be affordable, sustainable, and realistic. Integrating hardware and supporting equipment from other programs, specifically the Space Shuttle and Constellation Programs, may prove challenging since each piece of equipment was designed and tested for a different launch vehicle. For example, the GAO reported in July 2014 that the SLS's solid rocket boosters, originally designed for Constellation, must include a new nonasbestos insulating material in order to comply with environmental regulations.[15] Integrating the new material has already required changes to the manufacturing process and may have significant impact on meeting scheduled milestones. Moreover, achieving successful integration will require effective management of all three Programs – SLS, Orion, and GSDO.

[15] "Space Launch System," GAO-14-631.

Similar to the ISS extension and commercial crew development, the SLS and its associated Programs continue to face challenging future budgets. For example, the Orion Program anticipates receiving a flat budget of approximately $1 billion per year into the 2020s. Given this budget profile, NASA is using an incremental development approach under which it allocates funding to the most critical systems necessary to achieve the next development milestone, rather than developing multiple systems simultaneously as is common in major spacecraft programs. Prior work by the OIG has shown that delaying critical development tasks increases the risk of future cost and schedule problems.[16] Moreover, NASA Program officials admit that this incremental development approach is not ideal, but contend that it is the only feasible option given current funding levels.

In its 2014 report, GAO also noted that the SLS Program is carrying a $400 million risk to account for uncertainties in funding projections that, if unmitigated, could impact the hoped for December 2017 launch. Moreover, NASA has not developed complete life-cycle cost estimates for SLS launch vehicles once nominal operations begin and the Program has yet to solidify specific human rating and long-term mission requirements.

As we reported in August 2013, even after the SLS and Orion are fully developed and ready to transport crew, NASA will continue to face significant challenges concerning the long-term sustainability of its human exploration program.[17] For example, unless NASA begins a program to develop landers and surface systems, NASA astronauts will be limited to orbital missions.[18] In the current budget environment, however, it appears unlikely that NASA will obtain significant funding to begin development of this additional exploration hardware anytime soon, effectively delaying such development into the 2020s. Given the time and money necessary to develop landers and associated systems, it is unlikely that NASA would be able to conduct any manned surface exploration missions until the late 2030s at the earliest.

Managing NASA's Science Portfolio

With a relatively constant annual budget of approximately $5 billion since FY 2009, NASA's Science Mission Directorate oversees more than 100 projects and programs in various phases of development and operation. Many of them have cost more and taken longer to deliver than predicted and experienced funding instability, and some have received inconsistent direction from Congress and the Administration. For example, in September 2011 NASA rebaselined the James Webb Space Telescope (JWST), increasing its life-cycle budget from $4.96 billion to $8.84 billion and delaying its launch 4 years from June 2014 to October 2018.[19] These cost overruns and schedule delays affected other projects in NASA's science portfolio as Agency managers needed to identify additional money to support JWST. Moreover, in its FY 2015 budget proposal the Administration called for phasing out NASA's airborne observatory – the Stratospheric Observatory for Infrared Astronomy (SOFIA) – although the SOFIA Program's fate remains uncertain in light of congressional action to continue its funding. In addition to

[16] NASA OIG, "NASA's Challenges to Meeting Cost, Schedule, and Performance Goals" (IG-12-021, September 27, 2012), and "Status of NASA's Development of the Multi-Purpose Crew Vehicle" (IG-13-022, August 15, 2013).

[17] "Status of NASA's Development of the Multi-Purpose Crew Vehicle," IG-13-022.

[18] In July 2014, NASA OIG announced its audit examining space technology projects.

[19] A baseline defines the requirements, costs, schedule, and performance parameters of an acquisition program, and identifies milestones for measuring the program's progress.

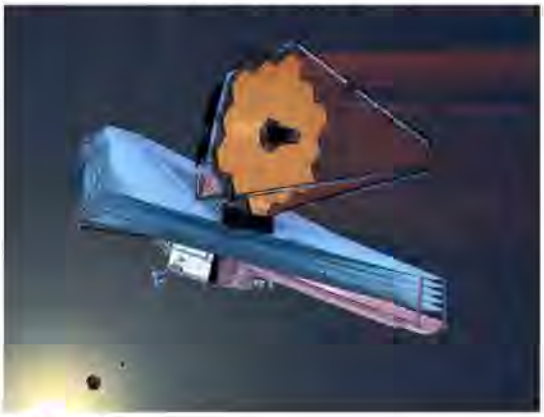
its portfolio of projects in development and primary operations, in September 2014 NASA's Senior Review found that all seven planetary science missions eligible for extension were worthy of continued funding, including the Mars Opportunity rover and the Lunar Reconnaissance Orbiter, both of which many observers thought the Agency would opt not to fund.

Managing this extensive portfolio in the current budget and political environment poses significant challenges to NASA. With the prospect of static budgets for the foreseeable future, it is imperative NASA work to keep projects on cost and schedule and, when necessary, make difficult choices between competing priorities.

James Webb Space Telescope

The JWST – the scientific successor to the Hubble Space Telescope – is expected to be the premier space-based observatory of the next decade when it is launched aboard a European Space Agency Ariane 5 in October 2018. (See Figure 3.) The observatory is designed to help understand the origin of the first stars and galaxies in the universe, the evolution of stars, and the formation of stellar systems and nature of objects in our own solar system. JWST consists of a 25-square-meter mirror composed of 18 smaller mirrors, an integrated science instrument module that houses the telescope's four instruments, and a tennis-court size sunshield. JWST's instruments are designed to work primarily in the infrared range of the electromagnetic spectrum, allowing for unprecedented observing capability.[20]

Figure 3: Artist Concept of James Webb Space Telescope



Source: NASA.

Like many NASA projects, JWST has faced significant challenges meeting cost, schedule, and performance goals. Program cost estimates in the late 1990s and early 2000s ranged from $1 billion to $3.5 billion, with an expected launch date between 2007 and 2011. However, following a change in the launch vehicle and revisions to other requirements, in 2005 NASA estimated life-cycle costs at $4.5 billion with a launch date in 2013. A year later, an independent review team reported that although the Program was technically sound, funding reserves were too low, phased too late in development, and insufficient to support such a complex Program. The review team also reported that a 2013 launch date was not achievable. In 2009, NASA rebaselined JWST with a life-cycle cost estimate of $4.9 billion and a June 2014 launch date.

[20] The electromagnetic spectrum is the full range of frequencies from radio waves to gamma rays.

Unfortunately, it soon became clear that neither this cost estimate nor the 2014 launch date were attainable. At the request of Congress, NASA commissioned another independent review, and in October 2010, this panel reported that while JWST's technical performance was "commendable and often excellent," the Program's budget and contingency funding reserve was severely understated and improperly phased, Program management was ineffective, and the Program could not meet its cost and schedule commitments.[21] Subsequently, NASA restructured the JWST Program, and in September 2011 established a revised baseline life-cycle cost estimate of $8.84 billion and an October 2018 launch date.

Although JWST Program management has made significant progress in the past 3 years – including completing all 18 primary mirror segments and the telescope structure, testing of all science instruments and a full-scale test of the sunshield, and addressing technical challenges such as inadequate spacecraft mass margin – significant challenges remain. For example, in spring 2014 the aft unitized pallet structure used to support the sunshield was found to have manufacturing deficiencies due to moisture from tooling equipment. This issue has eroded about 2 months of schedule reserve as corrective actions were evaluated. In addition, development of a device to cool one of JWST's science instruments (the "cryocooler") continues to slip from its cost plan and use a disproportionate share of the Program's unallocated future expenses and schedule reserve.[22] Adding to these individual challenges is an overall concern about the relatively low level of unallocated future expenses available to the Program for FY 2015.

As we stated in a September 2012 report, historically NASA has taken funds from other programs when highly visible flagship missions experience significant cost growth.[23] Although Congress has explicitly cost-capped JWST at its current baseline, because it is the largest science project in NASA's portfolio any future budgetary and programmatic challenges could negatively affect other projects in the Agency's science portfolio.

SOFIA – Stratospheric Observatory for Infrared Astronomy

The SOFIA Program – the second most expensive operating mission in NASA's astrophysics portfolio – uses a heavily modified Boeing 747SP fitted with a 2.7-meter telescope to study the universe. SOFIA can observe both infrared and visible wavelengths and is particularly well suited for investigating the formation of massive stars and planets. The Program, which in 2014 reached full operational capability after 23 years of formulation and development at a cost of nearly $1.1 billion, more than 300 percent over original estimates and 13 years behind schedule, faces an uncertain future. The Administration's FY 2015 budget proposed placing SOFIA in storage unless NASA could identify partners to subsidize its $80 million annual operating costs; however, as of September 2014 NASA had not identified additional partners to assist with funding. At the same time, FY 2015 appropriations legislation in both the U.S. Senate and House of Representatives contain funding to continue the Program.

[21] Independent Comprehensive Review Panel, "James Webb Space Telescope (JWST) Independent Comprehensive Review Panel (ICRP): Final Report" (October 29, 2010).

[22] Unallocated future expenses are costs expected to be incurred but not yet allocated to a specific task.

[23] "NASA's Challenges to Meeting Cost, Schedule, and Performance Goals," IG-12-021.

In a July 2014 report, we examined the long-term demand and viability of SOFIA over its planned 20-year operational life.[24] We found the Program faces immediate challenges as a result of the Administration's proposal to cease funding, including possible delay of planned aircraft maintenance and possible loss of key personnel while Congress debates whether to continue the Program. We also identified several challenges NASA managers need to address to ensure the best possible return on investment if the decision is made to continue the Program.

Specifically, the SOFIA Program must take steps to maintain demand for the observatory over the next 2 decades. For example, we found NASA's plans to introduce new technology every 4 years may be too infrequent. We also found grants provided to many researchers are insufficient for them to complete projects and publish results. In addition, we found SOFIA's current requirement to fly 960 annual research hours may not be optimal and the Program lacks procedures to assess its scientific "return on investment." Finally, we determined the Program's proposed organizational structure for SOFIA's operational phase does not provide adequate oversight of mission critical functions. Failure by NASA to address these issues could reduce demand for SOFIA and affect the quality of its science.

Ice, Cloud, and land Elevation Satellite-2

Using space-borne laser altimetry, the Ice, Cloud, and land Elevation Satellite-2 (ICESat-2) is designed to measure mass changes in the polar ice sheet in an effort to understand the mechanism driving the changes and the impact those changes will have on global sea levels. Following a challenging formulation phase that began in December 2009 and included multiple schedule delays and revised plans and cost growth, in December 2012 NASA established an $860.2 million life-cycle cost baseline for ICESat-2 and a May 2017 launch date. However, in January 2014 NASA reported to Congress that challenges developing the laser instrument would cause ICESat-2 to exceed its budget and face launch delays.[25]

In May 2014, NASA approved a revised plan and rebaseline under which life-cycle costs rose to $1.06 billion and the launch date delayed until June 2018. Implications of these delays reverberate across other NASA science platforms – specifically, NASA aircraft that will need to continue flying missions to observe the polar ice sheet until ICESat-2 is operational. Although the Earth Science Division Director stated additional funding for the Project would be found within the Earth Science Division, he could not rule out delays to future projects as a result.

Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer

The $1.1 billion Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer (OSIRIS-REx) mission is a sample return mission that will study a near-Earth asteroid. The spacecraft is scheduled to launch in October 2016, rendezvous with asteroid Bennu (formerly 1999 RQ36) in 2018, and return samples to Earth in 2023. In November 2013, we concluded a preliminary review of OSIRIS-REx after finding Project management has been controlling costs, meeting milestones, and

[24] NASA OIG, "SOFIA: NASA's Stratospheric Observatory for Infrared Astronomy" (IG-14-022, July 9, 2014).

[25] In August 2014, we concluded a preliminary review of ICESat-2 and found Project management was challenged by the inexperience of the small business contractor responsible for designing and developing the altimeter's laser.

achieving technical objectives. We also found that OSIRIS-REx appears to be positioned to meet its launch window – an opportunity that may not be available again for approximately 6 years given alignment issues between Earth and the target asteroid.[26]

However, a July 2014 fire at a contractor facility destroyed a component that was designed to house the OSIRIS-REx Visible-Infrared Spectrometer instrument and its associated hardware. The contractor was the only qualified source for performing the coating work that needed to be done on the component. OSIRIS-REx management is evaluating using a flight-ready spare while also constructing an additional spare unit. Although management believes there is sufficient time in the schedule to accomplish the extra work, the schedule margin for the instrument has been reduced and is likely to cost an additional $400,000 or more.

Solar Probe Plus

The Solar Probe Plus mission is designed to be the first spacecraft to fly within the sun's atmosphere, or corona, to investigate coronal heating and the origin and evolution of solar wind. In 2009, while the mission was still in early formulation, NASA recognized that higher budget priorities did not leave sufficient funding to support a launch in 2015 and determined that the next feasible launch window would be 2018. In January 2012, NASA established a preliminary life-cycle cost estimate range of $1.23 billion to $1.44 billion and a July 2018 launch date. In March 2014, the Agency established a baseline life-cycle cost of $1.55 billion and a launch date of July 2018. Project management also determined that risk could be reduced by utilizing a heavy-class launch vehicle. While NASA had already spent approximately $16 million designing and developing a high performance upper stage for use on a modified Atlas V launch vehicle, the switch to the heavy-class vehicle allowed NASA to cease development of the custom stage without increasing the Launch System budget. Unfortunately, by using a heavy-class launch vehicle, NASA could end up paying substantially more – potentially $200 million – than was originally budgeted for the modified Atlas V.

Near-Earth Objects Observation Program

In 2005, Congress tasked NASA with implementing a program to find and track comets and asteroids known as near-Earth objects (NEO) greater than 140 meters in diameter (460 feet) to assess their threat to Earth and set a goal that NASA catalogue 90 percent of NEOs by 2020. Although NASA's NEO Program budget has increased 10-fold from FY 2009 to FY 2014 ($4 million to $40 million), the Agency will not be able to meet its goal. In a September 2014 report, we found that despite this large funding increase and expanded responsibilities, the NEO Program's management structure remains organized under a single Program Executive who manages a loosely structured conglomerate of research activities that are not well integrated and lack a Program oversight framework, objectives, and established milestones to track progress.[27] We believe the Program would be more efficient, effective, and transparent were it managed in accordance with standard NASA research program requirements. We made five recommendations to NASA, including that the Agency perform an analysis to determine the number of staff required to administer the Program; NASA agreed to take corrective action.

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[26] There is a possible launch opportunity in September 2017, but launching in that timeframe is not currently part of the Project plan.

[27] NASA OIG, "NASA's Efforts to Identify Near-Earth Objects and Mitigate Hazards" (IG-14-030, September 15, 2014).

Ensuring the Continued Efficacy of the Space Communications Network

NASA's Space Communications and Navigation (SCaN) Program is responsible for providing communications, navigation, and transmission of scientific data to spaceflight missions. SCaN is comprised of three networks: (1) the Near Earth Network, which covers low Earth orbit and portions of geosynchronous and lunar orbit; (2) the Space Network, which controls the Tracking and Data Relay Satellites (TDRS) through a network of geographically diverse ground systems; and (3) the Deep Space Network, which covers NASA communications beyond low Earth orbit, including planetary exploration missions to Mars and beyond. SCaN operates its three Networks as part of a unified Network to meet mission needs. Without SCaN services, NASA could not receive data transmissions from its satellites and robotic missions or control such missions from Earth, and space hardware worth tens of billions of dollars would be little more than orbital debris. While NASA has provided these services for over 30 years, many of its current satellite communications systems are aging and increasingly difficult to repair.

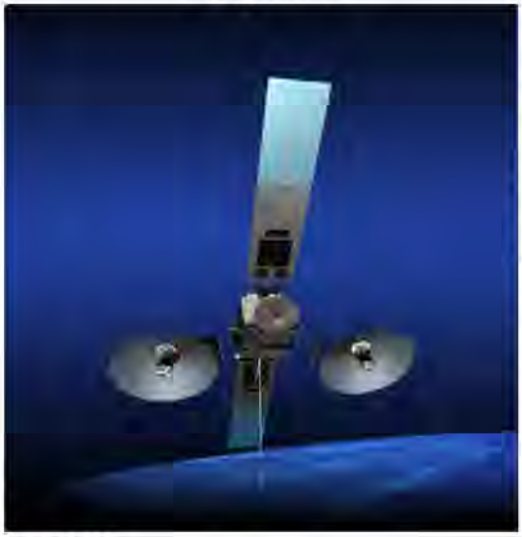
In 2006, NASA initiated the SCaN Program to create an integrated Agency-wide space communications and navigation architecture. The evolution of the integrated system will take place in phases. With a planned FY 2014 budget of $554 million, the Near Earth, Space, and Deep Space Networks initially will remain independent. In the interim, SCaN is adding new capabilities that extend the functionality of the Networks and will be incorporated into the integrated architecture. SCaN also manages the Spectrum Program for NASA and is deeply involved in this issue with other space-faring nations. The Spectrum Program ensures all NASA activities comply with national and international laws applicable to the use of the electromagnetic spectrum. Nearly every endeavor NASA undertakes requires communications or data transfer via the electromagnetic spectrum.

We are examining the SCaN Program through a series of audits, the first of which focused on the Space Network and issued in April 2014.[28] In that report, we found key components of the Space Network are not meeting planned cost, schedule, and performance goals. Taken together, the delays and cost growth increase the risk the Space Network will be unable to continue to provide adequate communication services to NASA missions and its customers.

NASA plans to upgrade the Space Network through an $860 million Space Network Ground Segment Sustainment (SGSS) Project. The purpose of the SGSS Project is to implement a modern ground system that will enable delivery of high quality services to the Space Network community while significantly reducing operations and maintenance costs. Without the upgrades, the ground system will become increasingly unreliable and more expensive to maintain.

[28] "Space Communications and Navigation: NASA's Management of the Space Network," IG-14-018.

Figure 4: Artist Concept of Tracking and Data Relay Satellite



Source: NASA.

To complement the ground system, NASA maintains the TDRS fleet of satellites that transmit the tracking, data, voice, and video services from the ground station to the ISS, NASA's space and Earth science missions, other Federal agencies, and commercial users. The Space Network is in the process of upgrading and replenishing failing satellites, many of which are operating well beyond their planned lives. The TDRS replenishment efforts are major components of maintaining Space Network capabilities. By 2016, four of the nine TDRSs will reach the end of their expected operational lives. Moreover, a NASA study indicates that one of the spare satellites the Agency has in on-orbit storage is already operating 15 years past its design life and could fail as soon as 2014. However, NASA currently has only two new third-generation satellites in orbit to replace four aging satellites. Although NASA had planned to launch another TDRS as early as December 2015, the Agency now expects to delay that launch by as many as 6 years because it lacks funding for a launch vehicle. Further, the Agency's decision in 2013 not to exercise the option to purchase a fourth satellite at a favorable price will result in NASA paying considerably more for a replacement satellite in the future. (See Figure 4.)

We found that the SGSS Project may cost $329 million more than NASA's baseline commitment agreement of $862 million and the schedule for completion likely delayed more than 1.5 years. The cost overrun will require SGSS Project managers to reassess their original requirements and the schedule slip means Space Network officials will have to reprioritize and mitigate the Network's obsolescence risks longer than planned – tasks that will require additional funding. Moreover, any operations and maintenance savings NASA expected to achieve through implementation of the SGSS Project will be delayed for several years.

Further, because of budget reductions and the loss of other expected revenue, in FY 2016 the Space Network will not have sufficient funding to meet all planned service commitments. Although NASA agreed to provide free access to Space Network services for some customers beginning in FY 2014 in exchange for their contributions to the development of two satellites several years earlier, the Agency failed to adequately plan for the resulting loss of approximately $70 million per year in revenue. Consequently, the Space Network has a projected $63 million budget shortfall in FY 2016 and even larger estimated shortfalls in subsequent years. Finally, as we had reported in a prior audit, we found that NASA has not kept current the rate it charges customers for use of the Space Network and, as a result, may be absorbing costs for services used by other Federal agencies and commercial customers.[29]

[29] NASA OIG, "Review of NASA's Tracking and Data Relay Satellite System" (IG-10-023, September 21, 2010).

In our April 2014 report, we recommended the Agency (1) require the SGSS Project Office to revise its cost estimate and, based on those results, adjust the Project baseline and Agency baseline commitment as necessary; (2) report the appropriate baseline commitment and/or status to Congress; (3) ensure the SGSS Project passes a termination review prior to any rebaselining; and (4) examine options to increase funding for the Space Network. We also recommended NASA document the cost factors and formulas used for reimbursable rates and ensure those rates are reevaluated and new rates set on an annual basis. NASA concurred or partially concurred with our recommendations.

NASA is also upgrading its Deep Space Network. Established in 1963 to provide communications for NASA robotic missions operating outside of Earth orbit, the Deep Space Network provides communication for international spacecraft and facilitates scientific investigations through radio astronomy, radio science, and radar activities. NASA runs the Deep Space Network from three ground-based sites (Goldstone, California; Madrid, Spain; and Canberra, Australia), with one 70-meter antenna and multiple 34-meter antennas at each location for around-the-clock coverage. As part of the upgrade, NASA will enhance antenna assets by adding new 34-meter antennas by 2025 at a cost of $393 million. The upgrades will support a greater number of missions and spacecraft as well as the increasingly complex data transfer requirements of those missions. For example, NASA projects future deep space missions will require faster data transmission than the current system can provide and future robotic missions more precise spacecraft navigation for entry, descent, landing, and outer planet explorations. The improved Network will also support manned missions to Mars.

We initiated our audit of the Deep Space Network in May 2014 to assess how NASA is identifying and adjusting capabilities to meet mission requirements; managing program, cost, schedule, and performance; and addressing key risks.

Overhauling NASA's Information Technology Governance

NASA spends more than $1.5 billion annually on a portfolio of information technology (IT) assets that includes approximately 500 information systems the Agency uses to control spacecraft, collect and process scientific data, and enable its personnel to collaborate with colleagues around the world. IT plays an integral role in every facet of Agency operations, and hundreds of thousands of individuals, including NASA personnel, contractors, members of academia, and the public, rely on NASA IT systems daily.

IT governance is a process for designing, procuring, and protecting IT resources. Because IT is intrinsic and pervasive throughout NASA, the Agency's IT governance structure directly affects its ability to attain its strategic goals. For this reason, effective IT governance must balance compliance, cost, risk, security, and mission success to meet the needs of internal and external stakeholders. However, for more than 2 decades NASA has struggled to implement an effective IT governance approach that appropriately aligns authority and responsibility commensurate with the Agency's overall mission. Since at least 1990, the OIG and GAO have highlighted a series of challenges stemming from the limited authority of NASA's Chief Information Officer (CIO), decentralization of Agency IT operations, ineffective IT governance, and shortcomings in IT security.

In a June 2013 audit, we examined whether NASA's Office of the Chief Information Officer (OCIO) has the organizational, budgetary, and regulatory framework needed to effectively meet the Agency's varied missions.[30] We found the decentralized nature of NASA's operations and its longstanding culture of autonomy hinder its ability to implement effective IT governance. The CIO has limited visibility and control over a majority of the Agency's IT investments, operates in an organizational structure that marginalizes the authority of the position, and cannot enforce security measures across NASA's computer networks. Moreover, the current IT governance structure is overly complex and does not function effectively. As a result, Agency managers tend to rely on informal relationships rather than formalized business processes when making IT-related decisions. While other Federal agencies are moving toward a centralized IT structure under which a senior manager has ultimate decision authority over IT budgets and resources, NASA continues to operate under a decentralized model that relegates decision making about critical IT issues to numerous individuals across the Agency, leaving such decisions outside the purview of the NASA CIO. As a result, NASA's current IT governance model weakens accountability and does not ensure that IT assets across the Agency are cost effective and secure.

With mission critical assets at stake and in an era of shrinking budgets, NASA must take a holistic approach to managing its portfolio of IT systems. To overcome the barriers that have resulted in the inefficient and ineffective management of the Agency's IT assets, we made a series of recommendations to overhaul NASA's IT governance structure by centralizing IT functions and establishing the Agency CIO as the top management official responsible for the Agency's entire IT portfolio. This would include empowering the CIO to approve all IT procurements over a monetary threshold that captures the majority of IT expenditures and making the CIO a direct report to the NASA Administrator. We also recommended the Administrator reevaluate the relevancy, composition, and purpose of NASA's primary IT governance boards in light of the changes made to the governance structure and require the use of reconstituted governance boards for all major IT decisions and investments. Finally, we suggested the NASA Administrator reevaluate the resources of the OCIO to ensure that the Office has the appropriate number of personnel with the appropriate skills.

Effective implementation of the recommendations will require a cultural shift and significant changes to the Agency's IT management decision-making regime, including the realignment of authority and responsibilities. NASA management has acknowledged the need for change and in our view is taking a considered approach in implementing corrective action. To date, NASA has made the Agency CIO a direct report to the NASA Administrator and completed an organizational assessment to determine if the OCIO has the appropriate number of personnel with the proper capabilities. The Agency is currently implementing phase two of a three-part overhaul of the IT governance model that entails reviewing and revising existing board charters, increasing CIO authority and visibility over Center IT assets including review and approval of IT purchase requests, and assessing the titles and roles of Center and Mission CIOs to more clearly delineate these position's roles and responsibilities. NASA anticipates completing corrective action to address all recommendations by the spring of 2015.

[30] NASA OIG, "NASA's Information Technology Governance" (IG-13-015, June 5, 2013).

Ensuring the Security of NASA's Information Technology Systems

The large number of NASA networks and websites coupled with the Agency's statutory mission to share scientific information present unique IT security challenges. For FYs 2013 and 2014, NASA reported 3,649 computer security incidents resulting in the installation of malicious software on or unauthorized access to Agency computers. These incidents included individuals testing their skills to break into NASA systems, well-organized criminal enterprises hacking for profit, and intrusions that may have been sponsored by foreign intelligence services seeking to further their countries' objectives. Moreover, NASA's vast connectivity with outside organizations – most notably nongovernmental entities such as educational institutions and research facilities – offers cybercriminals a larger target than most other Government agencies.

We recently reported that NASA manages approximately 1,200 publicly accessible web applications, or about half of all publicly accessible, nonmilitary Federal Government websites, that share scientific information with the public, collaborate with research partners, and provide Agency civil servant and contractor employees with remote access to NASA networks.[31] Hundreds of these web applications are part of IT systems NASA characterizes as high- or moderate-impact, meaning that a security breach could result in the loss of sensitive data or seriously impair Agency operations.

In FY 2013, NASA reported exploitation of vulnerable web applications accounted for one-third (61 of 183) of the Agency's total IT security breaches, with several resulting in the loss of sensitive information and disruption to Agency operations. For example, in July 2013 hackers compromised a NASA Shared Services Center website containing personally identifiable information of Agency civil servants and contractors. Further, several NASA websites hosted by the Ames Research Center had to be taken offline in September 2013 after an international hacker posted political statements opposing U.S. policy. Moreover, the frequency and sophistication of attacks directed at NASA's publicly accessible web applications has increased dramatically over the past several years. Between FYs 2012 and 2013, NASA experienced an 850 percent increase (from 42 to 359) in structured query language injection attacks that attempted to compromise Agency web applications to steal data or gain a foothold into its networks for future exploitations.[32]

To protect the Agency against inevitable attacks on its IT systems, NASA must ensure that those systems and associated components are regularly safeguarded, assessed, and monitored. To assist in this effort, in FY 2014 the OCIO dedicated an additional $10 million to fund a series of initiatives to address IT security concerns, including

- modernizing and expanding continuous monitoring and network penetration testing;
- deploying intrusion detection systems across mission, corporate, and research networks;
- increasing web application security scanning; and
- implementing intrusion prevention systems.

[31] NASA OIG, "Security of NASA's Publicly Accessible Web Applications" (IG-14-023, July 10, 2014). NASA's publicly accessible web applications consist mainly of websites, but also include web-based login portals and administrative systems that provide authorized personnel remote access to Agency IT resources.

[32] Structured query language (SQL) is an industry standard computer language used to query, operate, and administer many databases. In an SQL injection attack, the attacker appends (injects) instructions onto the end of a valid SQL statement in an attempt to gain unauthorized access to the system and its data.

The OCIO is in the final stage of deploying NASA's first intrusion prevention systems and recently has implemented risk management procedures to ensure critical and high vulnerabilities are appropriately mitigated.

Over the past 5 years, the OIG has issued 20 audit reports containing 65 recommendations designed to improve NASA's IT security. In the most recent of these reports, we examined NASA's efforts to identify and assess vulnerabilities on its publicly accessible web applications and mitigate the most severe vulnerabilities before hackers exploit them.[33] Reducing the Agency's extensive web "footprint" is one of the more effective ways NASA can counter the threat of cyber attacks. To this end, the OCIO and Center IT security officials are working to reduce NASA's web presence by eliminating unused and duplicative web applications and moving Agency websites to a public cloud-computing environment.[34]

That report also noted that NASA's ongoing efforts to reduce its web presence and to identify and scan for vulnerabilities on its publicly accessible web applications have improved Agency IT security. However, NASA needs to close remaining security gaps, strengthen program oversight, and further reduce the number of publicly accessible web applications. NASA developed an inventory of all publically available web applications maintained by NASA Headquarters and Centers and, consistent with best practices, identified vulnerabilities through automated scanning coupled with manual testing. In addition, during the 15-month period ending March 2014, NASA reduced by 15 percent the number of its publicly accessible web applications.

Despite this progress, we found deficiencies in the design and implementation of NASA's program that leaves the Agency's publicly accessible web applications at risk of compromise. These deficiencies occurred because NASA did not prioritize identification of security vulnerabilities by seriousness of potential impact, identify the underlying cause of vulnerabilities, identify weaknesses associated with unsound IT security practices, or implement an effective process to ensure timely mitigation of identified vulnerabilities. Finally, while NASA has made strides in reducing the scope of its web presence, the Agency's remaining 1,200 publicly accessible web applications continue to present a large target for hackers.

In another review completed this year, we evaluated NASA's management of smartphones, tablets, basic cell phones, and AirCards.[35] These mobile devices pose security threats because of their size, portability, constant wireless connection, physical sensors, and location services. Further, the diversity of available devices, operating systems, carrier-provided services, and applications present additional security challenges. We found that although NASA began enforcing security requirements on all smartphones and tablets that connect to NASA's email systems in September 2013, the Agency still needed to implement a technical tool to mitigate risks when those devices connect to NASA systems other than email. In response to our recommendations, the Agency is reviewing various technical tools and plans to complete corrective action in FY 2015.

[33] "Security of NASA's Publicly Accessible Web Applications," IG-14-023.

[34] A public cloud-computing environment consists of a third-party IT service provider (e.g., Amazon) that delivers services such as website hosting or data storage to consumers over the Internet.

[35] NASA OIG, "NASA's Management of its Smartphones, Tablets, and Other Mobile Devices" (IG-14-015, February 27, 2014). An AirCard is a device that provides the user with access to wireless broadband cellular services.

In addition to our audit work, the OIG focuses substantial resources investigating IT security issues. OIG investigators have conducted more than 110 investigations of breaches of NASA IT networks over the past 5 years and helped to secure convictions of hackers operating from such wide-ranging locations as Australia, China, Great Britain, Italy, Nigeria, Portugal, Romania, Turkey, and Venezuela. In one notable example, the OIG helped secure indictments of six Estonian nationals involved in a cybercrime scheme that infected millions of computer systems worldwide, including NASA systems, with malicious software. Thus far, the investigation has resulted in over $22 million in restitution and forfeiture orders and two guilty pleas, while legal proceedings for the other defendants continue. In another case, the OIG worked with other Federal agencies to obtain indictments of a British national in three Federal jurisdictions for infiltrating Government computer systems and aggravated identity theft.

Managing NASA's Infrastructure and Facilities

NASA is the ninth largest Federal Government property holder, controlling approximately 4,900 buildings and structures with an estimated replacement value of more than $30 billion. More than 80 percent of the Agency's facilities are 40 or more years old and beyond their design life. Under its current policy, NASA is required to maintain these facilities either in an operational status, or if they are not being used, in sufficient condition not to pose a safety hazard. However, NASA has not been able to fully fund required maintenance for its facilities and in 2014 estimated its deferred maintenance costs at $2.4 billion.

The OIG has conducted 12 audits over the past 5 years examining various aspects of NASA's efforts to manage its aging infrastructure.[36] In last year's management challenges report, we discussed our February 2013 audit assessing NASA's efforts to reduce unneeded infrastructure and facilities and identified 33 facilities – including wind tunnels, test stands, thermal vacuum chambers, airfields, and launch infrastructure – at NASA Centers across the country the Agency was not utilizing or for which NASA officials could not identify a future mission use.[37] These facilities cost the Agency more than $43 million to maintain in FY 2011 alone. We recommended NASA complete its ongoing comprehensive technical capabilities assessment and ensure that process is established into policy. We also recommended NASA develop a mechanism for communicating its decisions regarding facilities to outside stakeholders and ensure that process is updated, documented, and established into policy, as well as implement changes to the NASA Technical Capabilities Database to improve data accuracy.

NASA has yet to address our recommendations. According to Agency officials, responsive action is contingent upon completion of the work of NASA's Technical Capabilities Assessment Team (TCAT), which NASA established in 2012 to assess the Agency's technical capabilities, both workforce and physical assets,

[36] NASA OIG, "NASA's Independent Verification and Validation Program" (IG-14-024, July 16, 2014); "Audit of NASA's Environmental Restoration Efforts" (IG-14-021, July 2, 2014); "NASA's Management of Energy Savings Contracts" (IG-13-014, April 8, 2013); "Review of NASA's Explosives Safety Program" (IG-13-013, March 27, 2013); "NASA's Environmental Remediation Efforts at the Santa Susana Field Laboratory" (IG-13-007, February 14, 2013); "NASA's Efforts to Reduce Unneeded Infrastructure and Facilities" (IG-13-008, February 12, 2013); "NASA's Plans to Modify the Ares I Mobile Launcher in Support of the Space Launch System" (IG-12-022, September 25, 2012); "NASA's Infrastructure and Facilities: An Assessment of the Agency's Real Property Leasing Practices" (IG-12-020, August 9, 2012); "NASA's Infrastructure and Facilities: An Assessment of the Agency's Real Property Master Planning" (IG-12-008, December 19, 2011); "NASA Infrastructure and Facilities: Assessment of Data Used to Manage Real Property Assets" (IG-11-024, August 4, 2011); "NASA's Hangar One Re-Siding Project" (IG-11-020, June 22, 2011); and "Audit of NASA's Facilities Maintenance" (IG-11-015, March 2, 2011).

[37] "NASA's Efforts to Reduce Unneeded Infrastructure and Facilities," IG-13-008.

to enable NASA to make informed decisions regarding investment and divestment strategies. To date, TCAT has completed or is working on assessments of microgravity flight services, balloons, life sciences, Earth sciences research, and aircraft operations. The Agency expects the TCAT process will take several years to complete, and it is too early in the process for the OIG to assess its efficacy.

In another example of the difficulty NASA faces "right-sizing" its footprint, in a July 2014 audit we examined NASA's Independent Verification and Validation (IV&V) Program.[38] As part of NASA's quality control process, the IV&V Program assesses whether software associated with Agency science and spaceflight activities will meet program, cost, schedule, and safety requirements. More than 20 years ago, NASA was directed in appropriations legislation to provide West Virginia University with $10 million to establish an IV&V facility. (See Figure 5.) Subsequently, in January 1992 NASA awarded the West Virginia University Research Corporation (Corporation) a $10 million grant that it used to build a computer operations and research facility on the University's campus. According to the grant, upon completion of construction the Corporation would take title to the facility and become responsible for associated operations and maintenance (O&M) expenses. Nevertheless, NASA has continued to pay the facility's O&M costs, which over the last 20 years have amounted to more than $82 million. Moreover, although NASA does not own the facility, the IV&V Program paid the Corporation $993,000 in 2010 to replace its roof.

Figure 5. NASA IV&V Program Facility

Source: IV&V Program website.

We found that by continuing to occupy and maintain the West Virginia facility, NASA is paying more than necessary in O&M expenses, which leaves the Agency with less funding to perform actual IV&V services on NASA software projects. We estimated the Agency could save as much as $9.7 million between FYs 2015 and 2018 if the IV&V Program took steps to reduce costs associated with the facility. In order to make additional funds available for review of mission-critical software, we recommended NASA analyze alternatives for reducing occupancy costs associated with the facility, including abandoning the facility and moving staff to an existing NASA Center or relocating the staff to a nearby office building that would cost significantly less. NASA is currently analyzing alternatives for reducing occupancy costs and plans to complete its assessment by December 2014.

Leasing unneeded facilities offers NASA another means to help address maintenance costs associated with its aging and underutilized facilities. However, Federal law and policy prohibit NASA from leasing facilities for which it has no current or future mission-related use. Instead, the Agency should consider other options for these facilities, such as demolition or reporting the property to the General Services Administration for sale or transfer to another entity. The challenge for NASA is to use leasing when appropriate to generate revenue to offset facilities operations and maintenance costs while not using it as a way to hold on to facilities it does not need.

[38] "NASA's Independent Verification and Validation Program," IG-14-024.

In an October 2014 report, we examined NASA's efforts to transform the Kennedy Space Center (Kennedy) from an exclusively Government launch complex to a multiuser spaceport by making available to private industry and other Government agencies facilities left underutilized by the retirement of the Space Shuttle Program.[39] We found Kennedy has made progress in this effort and has leased or is in the process of negotiating leases for approximately half of its underutilized assets. However, because NASA lacks clear guidance regarding soliciting and awarding lease agreements, Kennedy's process for notifying potential tenants of leasing opportunities evolved over the years and the Center has not consistently provided interested parties with information regarding how Kennedy officials would choose among competing applicants. Moreover, as state and privately run spaceports develop, constraints inherent to operating on a Federal facility may affect NASA's ability to continue to attract commercial partners to Kennedy. Given the disparity between the Agency's infrastructure and its mission-related needs, as well as the likelihood of continued constrained budgets, it is imperative NASA move forward aggressively with its infrastructure reduction efforts. To achieve this goal, the Agency will need to move away from its longstanding "keep it in case you need it" mindset and overcome historical incentives for the Centers to build up and maintain unneeded capabilities. In addition, NASA officials need to manage the concerns of political leaders about the impacts eliminating or consolidating facilities will have on Centers' missions, their workforces, and the local communities. Moreover, abrupt changes in the strategic direction of the Nation's space policy by the President, Congress, and NASA will continue to add an element of uncertainty regarding the missions the Agency will pursue and therefore the facilities it will need to achieve those missions.

As we noted in our February 2013 report on underused facilities, NASA's best efforts to address these challenges may ultimately be insufficient to overcome the cultural and political obstacles that have impeded past efforts to reduce Agency infrastructure.[40] Accordingly, an outside process similar to the Department of Defense's Base Realignment and Closure Commission may be necessary to make the difficult but necessary decisions.

Ensuring the Integrity of the Contracting and Grants Processes and Proper Use of Space Act Agreements

Approximately 80 percent of NASA's $16.8 billion FY 2013 budget was spent on contracts to procure goods and services and provide funding to grant and award recipients.[41] In addition to these more conventional types of instruments, each year NASA enters into hundreds of Space Act Agreements to advance science and technology, stimulate new industries such as commercial spaceflight, and encourage companies to work with NASA that traditionally have not pursued more conventional agreements because of the complexity of regulatory requirements and associated costs. Space Act Agreements may be reimbursable where the partner reimburses NASA's costs in full or in part, nonreimbursable, or funded where NASA transfers appropriated funds to the partner. In each case, the agreements establish a set of legally enforceable promises requiring a commitment of NASA resources, such as personnel, funding, equipment, expertise, information, or facilities.

[39] NASA OIG, "NASA's Launch Support and Infrastructure Modernization: Commercial Space Launch Activities at Kennedy Space Center" (IG-15-003, October 23, 2014).

[40] "NASA's Efforts to Reduce Unneeded Infrastructure and Facilities," IG-13-008.

[41] Approximately 75.5 percent was spent on contracts with the remaining 4.5 percent funding grants and cooperative agreements.

Given the large amount of taxpayer money NASA spends on contracts, managers face an ongoing challenge to ensure the Agency pays contractors in accordance with contract terms and receives fair value for its money. For its part, the OIG seeks to assist NASA by examining Agency-wide procurement processes; auditing individual contracts, grants, and cooperative agreements; and investigating potential misuse of Agency contract and grant funds. During the past year, the OIG continued to uncover fraud and other problems related to NASA contracts. For example:

- In February 2014, a Federal judge in the Eastern District of Virginia sentenced a former executive of a personnel services company to 5 years in prison and 2 years supervised release and to forfeit $2.9 million in ill-gotten gains. The executive had pled guilty to major fraud for misrepresenting his firm as a disadvantaged small business in order to secure more than $2.4 million in NASA security contracts.
- In July 2014, a NASA contractor and its president were indicted on eight counts of wire fraud and three counts of false claims related to contracts with NASA and the National Science Foundation (NSF). The joint NASA OIG and NSF OIG investigation found $800,000 in NASA and NSF contract funds had been used for personal rather than Government purposes.

One area that presents an ongoing challenge is NASA's Small Business Innovation Research (SBIR) Program. As of August 2014, NASA had awarded approximately $69 million in FY 2014 funds to small businesses under this Program to stimulate technological innovation, increase participation by small businesses in federally funded research and development, and increase private sector commercialization of innovations derived from federally funded research and development efforts. Although NASA has taken steps to minimize opportunities for misconduct in the SBIR Program, the OIG continues to investigate allegations of fraud by award recipients. For example, in May 2014 two individuals were indicted for defrauding NASA, NSF, and the Defense Advanced Research Projects Agency by proposing thousands of hours of labor for highly skilled employees who did not actually work for their companies. Another investigation uncovered a NASA contractor that received more than $1.5 million in SBIR contracts based on duplicate proposals submitted to NASA and the U.S. Air Force.

The OIG's audit work during the past year also illustrated that NASA has significant work to do to improve its multibillion dollar contracting and procurement operations. For example, we found NASA needs to significantly improve its "strategic sourcing" efforts.[42] Strategic sourcing involves centralizing contracting decisions or using Government-wide contracts to lower prices and reduce administrative duplication. Although NASA procurement officials established a Strategic Sourcing Program in 2006, we found the Program has missed opportunities to maximize savings because it failed to develop a robust, Agency-wide effort. Specifically, NASA has not conducted a comprehensive, Agency-wide spend analysis to identify commodities that could benefit from a more strategic procurement approach. Further, although NASA performed limited spend analyses on individual commodities, it has not established requirements regarding how such analyses should be developed, analyzed, and used. While NASA officials said they have realized savings under specific strategic sourcing initiatives, NASA does not track its Agency-wide strategic sourcing efforts and therefore was unable to determine the extent of any efficiencies or cost savings achieved. We made six recommendations to strengthen the Agency's Strategic Sourcing Program.

[42] NASA OIG, "NASA's Strategic Sourcing Program" (IG-14-010, January 15, 2014).

In another audit, we examined the NASA's process for closing out expired award instruments, including deobligating unused funds.[43] Federal and Agency guidelines provide timeframes in which this process should occur, and meeting these timeframes can help limit NASA's exposure to financial risk by promptly identifying any improper payments the Agency may have made and ensuring contractors and grantees have satisfied the terms of the awards. Moreover, timely deobligation of unused funds frees up money for other Agency or Government uses.

We found that although NASA has slowed the growth of its backlog of instruments awaiting closeout, it needs to make further improvements to its closeout process. First, NASA's process is not uniform across the Agency, with Centers varying in the timing and types of award instruments they send to NASA's close-out contractor. As a result, some Centers are not optimizing the services provided by the contractor, thereby contributing to the backlog. Second, contract personnel at the Centers use different guidance when closing out award instruments, impairing their ability to share information and work across the Centers. Third, although we found that NASA generally deobligates unused funds in a timely manner, we identified $2.7 million in funds the Agency did not timely deobligate. Based on this finding, we estimated that Agency-wide NASA has more than 4,000 instruments with $61 million in funds that were not timely deobligated. Fourth, the Agency closed some award instruments without sufficient evidence that the associated funding had been spent appropriately. Consequently, NASA has increased risk that the costs associated with more than $43 million in awards may not be allowable and reasonable. Finally, we identified several best practices that, if applied across the Agency, could help strengthen NASA's closeout process.

We also continued to work with NASA to improve the Agency's practices relating to award-fee contracts. In a November 2013 audit, we found that although NASA had implemented processes intended to improve contractor performance and acquisition outcomes, questionable practices – including overly complex award formulas and a contract clause designed to hold contractors accountable for the quality of the final product that disregards interim performance evaluations – have diminished the effectiveness of award-fee contracts at the Agency.[44] In addition, we found the quality of data entered into the award fee evaluation system lacking, which reduced NASA's ability to measure award fee effectiveness. Although the Agency initially disagreed with 7 of our 12 recommendations, we have now closed or resolved all but 2 recommendations. Most significantly, NASA continues to disagree with our position that the Agency's practice of making funds not awarded during interim award periods available in the final award pool circumvents a provision in the FAR that prohibits Federal agencies from "rolling over" unearned fees to subsequent performance periods. In our view, NASA's practice promotes a philosophy that as long as a mission ultimately provides good science data the Agency will overlook cost and schedule overages that occur during project performance.

NASA also faces the ongoing challenge of ensuring the grant funds the Agency distributes each year are administered appropriately and that recipients are accomplishing stated goals. NASA awards approximately $850 million in grants and cooperative agreements annually to facilitate research and development and to fund scholarships, fellowships, and stipends to students and teachers, as well as research by educational institutions or other nonprofit organizations. The OIG conducted several audits during the past year to identify weaknesses in NASA's management of grants and cooperative

[43] NASA OIG, "NASA's Award Contract Closeout Process" (IG-14-014, February 12, 2014).

[44] NASA OIG, "NASA's Use of Award-Fee Contracts" (IG-14-003, November 19, 2013).

agreements. In one audit, we found that the recipient had underestimated expenditures and overpromised on delivery dates, and therefore would need $595,000 more in award funds and an additional 16 months to complete the promised work.[45] Other audit findings included administrative errors in pre-award and award documentation and the failure to obtain necessary IT security plans.

Over the past 5 years, the OIG has conducted 38 grant fraud investigations resulting in five prosecutions, $13.5 million in restitution and recoveries, and $15 million in civil settlements. For example, an ongoing investigation found that a senior faculty member of a Texas university misrepresented her participation in multiple NASA grant awards, resulting in the payment of $239,000 in unallowable costs. The university fired the faculty member, and NASA is in negotiations with the university seeking return of the questioned funds. In a separate investigation, a political consultant pleaded guilty in August 2014 to helping conceal the improper use of NASA Federal grant funds to repay an illegal campaign debt incurred by an elected official during a 2007 run for office.

Given the large sums of money at stake, we intend to continue to monitor NASA's performance in administering its contracts and grants as we work with the Agency to develop solutions to address the deficiencies identified in our reports. In this regard, we are currently performing audits examining whether NASA is properly and economically using blanket purchase agreements (a procurement vehicle to enable agencies to maximize savings opportunities through competition and price discounts) and whether it has established adequate procedures to ensure costs charged by Agency contractors are properly supported, allowable, reasonable, and allocable. We also continue to audit individual grants and cooperative agreements.

This past year, we also examined NASA's use of Space Act Agreements.[46] Since NASA's inception, the Agency has entered into thousands of these agreements for such varied purposes as obtaining fundamental research to nurturing the development of commercial launch vehicles. While NASA has limited records showing how it used its Space Act authority in the early years, our analysis of more recent data shows that the number of Space Act Agreements increased by more than 29 percent between FYs 2008 and 2012.

We found NASA cannot identify the costs incurred or effectively measure the benefits derived from nonreimbursable Space Act Agreements because it lacks a close-out process or similar mechanism to document such results. Although the agreements involve no exchange of funds, NASA nevertheless bears the expense associated with any personnel, facilities, expertise, or equipment it contributes. Consequently, objectively assessing the value such Agreements bring to the Agency and to the broader aeronautical, scientific, and space exploration communities is difficult without such documentation. We also found NASA could better ensure equal access to its facilities and capabilities and increase interest in Space Act Agreement opportunities by expanding its efforts to solicit a broader number of potentially interested parties. In addition, we found that NASA has unclear guidance regarding when it is appropriate to use the agreements as opposed to leases and how the Agreements must align with the Agency's missions. Most Centers have interpreted NASA's policy to mean the covered activity must directly relate to a NASA mission, while others have taken the position that as long as the proceeds from an Agreement help maintain a needed facility or capability the actual activity performed need not

[45] NASA OIG, "Audit of NASA's Cooperative Agreement with BioServe Space Technologies – University of Colorado at Boulder" (IG-14-028, August 4, 2014).

[46] "NASA's Use of Space Act Agreements," IG-14-020.

directly relate to a NASA mission. Under the latter interpretation, Kennedy received $392,000 from NASCAR and other organizations for use of its Shuttle Landing Facility for aerodynamics testing and the Michoud Assembly Facility an estimated $2.9 million from movie production studios, engineering firms, and manufacturing companies that utilized excess office and warehouse space at the facility.

While there are no indications NASA has failed to collect fees associated with reimbursable Agreements, we found that the Agency cannot readily separate amounts billed and collected for these Agreements from proceeds of other types of reimbursable agreements because its accounting system does not have a common identifier to separate Space Act Agreements from other types of reimbursable activity. Finally, we questioned NASA's decision to refrain from including more specific information about Agency objectives and key safety elements in funded Space Act Agreements and believe it should consider being more prescriptive in the future when using funded agreements to develop spaceflight technology.

APPENDIX A: MANAGEMENT COMMENTS

National Aeronautics and Space Administration
Office of the Administrator
Washington, DC 20546-0001

October 20, 2014

TO: Inspector General

FROM: Administrator

SUBJECT: Agency Response to "NASA's 2014 Top Management and Performance Challenges"

The National Aeronautics and Space Administration (NASA) fully appreciates the opportunity to review and comment on your assessment of "NASA's 2014 Top Management and Performance Challenges."

As you know, I am a strong supporter of the Office of Inspector General (OIG) and its mission to prevent and detect fraud, waste, and abuse, as well as to increase the efficiency and effectiveness of NASA's programs, projects, and operations. The audits and investigations that your office conduct provide valuable oversight and insight which contribute to the Agency's efforts to provide the taxpayer with maximum value for each dollar invested in NASA's wide-ranging, ambitious, and challenging portfolio.

The one overarching and seven specific management and performance challenges identified in your 2014 assessment provide NASA with additional tools and solutions sets for improvement, which the Agency continues to build upon. We continue to aggressively pursue mitigation of the challenges that your office has identified through the audits and investigations conducted by your office during this and previous years.

Charles F. Bolden, Jr.

Enclosure

Appendix A

MANAGEMENT'S RESPONSE
TO THE OFFICE OF INSPECTOR GENERAL'S MEMORANDUM ON
"NASA's 2014 TOP MANAGEMENT AND PERFORMANCE CHALLENGES"
November 2014

Overarching Management and Performance Challenge

We agree with the OIG's assessment that, going forward, NASA's principal challenge will be to effectively manage the Agency's varied programs in an uncertain budget environment, coupled with individual Agency-, project-, and facility-related challenges.

As a means to proactively address these challenges, NASA is embarking on new ways to do business; investing in new technology; and increasing the sustainability, accountability, and transparency in our operations, specifically:

Finding new ways to do business: We are leveraging more public-private partnerships and harnessing the ingenuity of the American people to accomplish our work. We have spent nearly 50 years mastering the science and art of getting to low-Earth orbit. We have proven the technologies and put the infrastructure in place. Now, we are ready to employ the capabilities of emerging U.S. commercial partners who can provide cargo and soon crew services. Transferring low-Earth orbit access to commercial providers allows us to focus our valuable resources on pursuing the next frontier: mastering human access to deep space. In addition, we are expanding our partnerships outside the traditional aerospace industry to share knowledge and expertise in areas such as manufacturing, information technology, and resource management. Also, recognizing the value of the American public as a strategic partner in addressing some of the country's most pressing challenges, NASA relies on the expertise, ingenuity, and creativity of the American public by enabling, accelerating, and scaling the use of open innovation methods, including prizes, challenges, crowdsourcing, and citizen science across NASA.

Investing in cutting-edge technologies: As we prepare for the proposed missions to an asteroid and then to Mars and for the doubling of the global commercial aviation fleet in 20 years, we are entering an exciting time in which we will push the very boundaries of research and technology development. We are implementing a space technology development and test program with partners from industry, academia, and other nations. This program will facilitate our objectives of building, flying, and testing new technologies that have the potential to increase capabilities, decrease costs, and expand opportunities for future space activities. As the enabler for safe and efficient aviation transformation, our research and technologies have formed the DNA of all modern aircraft. Through cutting-edge aeronautics research NASA continues to develop and test solutions that strengthen the air travel and transportation industry while minimizing environmental impact. We will continue to bring innovations to usher national and global air transportation systems into the 21st Century.

Appendix A

Increasing sustainability, accountability, and transparency: Our three strategic goals guide our major initiatives, they also focus on returning tangible benefits of cutting-edge technology development, as well as ensuring sustainability, accountability, and transparency in our operations. NASA's sustainability policy is to execute its mission without compromising our planet's resources so that future generations can meet their needs. Sustainability also involves taking action now to provide a future where the environment and living conditions are protected and enhanced. In implementing sustainability practices, NASA manages risks to mission, to the environment, and to our communities. To this end, NASA seeks to use public funds efficiently and effectively, promote the health of the planet, and operate in a way that benefits our neighbors. We are sharing our data, our successes, and our setbacks with the public at an unprecedented level. Through our transparency, we want the Nation to understand both why and how our challenging work will create a brighter future.

Specific Management and Performance Challenges

1. **Managing NASA's Human Space Exploration Programs: the International Space Station, Commercial Crew Transportation, and the Space Launch System**

International Space Station (ISS)
In January 2014, the Administration and NASA announced the extension of the operations and utilization of the International Space Station (ISS) until at least 2024. This extension enables NASA to make progress towards the goals of the ISS: extending human spaceflight beyond low-Earth orbit (LEO); enabling the development of the commercial market in LEO; conducting research to benefit humanity in areas such as medicine, physical and life sciences, and earth and space sciences; and providing the basis for exploration international partnerships. The ISS International Partners are expected to address extension in the next couple of years. This will allow sufficient time for each partner to determine their unique level of participation in the ISS program and exploration.

NASA has partnered with the Center for the Advancement of Science in Space (CASIS) to advance the development of the commercial market in LEO through development activities across private industry including pharmaceuticals, material sciences, biomedicine, and earth science. CASIS continues to expand its development activities to fully utilize the research and application capabilities provided by the ISS.

NASA and its International Partners have conducted extensive operational and maintenance analyses to determine the appropriate level of spares, maintenance cycles, and logistics necessary to maintain the ISS on-orbit platform to at least 2024. The partnership has also conducted structural and performance analyses to ensure that the ISS is structurally viable to at least 2028. System upgrades needed to operate the ISS to at least 2024, including docking systems and new lithium ion batteries for the electrical power system, are already under development. Larger external equipment and spares, such as the lithium ion batteries, are planned to launch on the Japanese HII Transfer Vehicle (HTV) prior to its retirement. Occasional failures of external hardware are to be expected, and NASA prepares for these with on-orbit spares and spacewalk preplanning. In response to faster-than-expected

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degradation of the solar arrays, NASA is assessing a variety of options to improve power generation/balance in the out years.

The ISS program is currently in the process of procuring commercial cargo transportation services. Once actual costs for transportation beyond the current Commercial Resupply Services (CRS) contract are known through the procurement process, the ISS will update its budget requests accordingly. Commercial crew development activities are currently underway. Once contracted commercial crew costs are known, these will also be incorporated into the ISS budget request.

Commercial Crew

NASA agrees with the four specific challenges identified by the OIG regarding the Commercial Crew Program (CCP), as well as the OIG's recognition of the significant progress that NASA has made regarding each of these challenges during the past year.

Unstable Funding: This challenge is largely outside of NASA's control. However, the Agency has made funding for the CCP a priority among its human spaceflight programs along with Orion, Space Launch System (SLS), and the ISS. NASA has consistently maintained the need for full funding for the CCP and will continue to do so. These efforts have been somewhat successful, as funds appropriated for the CCP budget have increased by an average of 30 percent over the last three years.

Integration of Cost Estimates with the Program Schedule: On September 16, 2014, NASA announced Commercial Crew Transportation Capability (CCtCap) awards to Boeing and SpaceX. The associated Request for Proposal (RFP) required the companies to provide comprehensive, fully integrated plans towards the development of their respective Crew Transportation Systems (CTSs). NASA reviewed these plans, which included detailed cost estimates and schedules along with supporting rationale, during its evaluation and accepted the proposals for Boeing and SpaceX. These companies are now under firm, fixed price contracts for completing the development of their CTSs.

Providing Timely Requirement and Certification Guidance: In the spring of 2014, NASA concluded the Certification Products Contracts (CPC) with SpaceX, Boeing, and Sierra Nevada. The primary objective of CPC was the deliverables, technical interchange, and NASA disposition of early life-cycle CTS certification products. The purpose of the contract deliverables was to assess the contractor readiness to transition to CCtCap. The final contract deliverables included: 97 alternate standards, 109 variances, 316 hazard reports, and Verification and Validation Plans and Certification Plans for each contractor. In addition, almost 500 background data documents were delivered by the contractors and reviewed by NASA. Through NASA's assessment of these deliverables, the Agency was able to give the companies clear and actionable feedback relative to NASA requirements. CPC was an outstanding accomplishment and each company was able to incorporate NASA's feedback into their designs going into CCtCap.

Finally, the OIG suggests that NASA has used funded Space Agreements to acquire human spaceflight services that meet NASA requirements. To clarify, NASA uses Space

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Act Agreements when the purpose of that activity cannot be met using a procurement contract, grant, or cooperative agreement. NASA uses funded Space Act Agreements to stimulate the private sector to develop and demonstrate human spaceflight capabilities that could ultimately lead to the availability of commercial human spaceflight services for both commercial and Government customers. With the recent award of the CCtCap contracts, NASA is now using procurement contracts to certify commercially-developed human spaceflight services to NASA requirements and acquire missions to the ISS.

Spaceflight Coordination Issues with Other Federal Agencies: NASA has made significant progress in this area since the last reporting period. NASA and the Federal Aviation Administration (FAA) signed a Joint Program Management Plan describing the detailed roles and responsibilities each agency has for the execution of the CCP. In addition, a program-level NASA/FAA working group and Headquarters-level NASA/FAA legal team were established and have been making excellent progress on issues related to NASA astronauts flying on FAA-licensed vehicles. A substantial number of issues associated with NASA requirements and FAA regulations have been closed and action plans exist on closing the remaining issues. For example, the FAA published an interpretation, which addresses the ability of astronauts to perform operational functions during a commercial launch or reentry. The FAA published additional interpretations covering waivers and international partners. In addition, a Launch & Entry Steering Group has been established which is a forum for NASA, the United States Air Force, and the FAA to establish consistent policy regarding crew, range, and public safety. The charter for this group has been signed and an initial meeting has been accomplished.

Space Launch System (SLS)
The Exploration Systems Development (ESD) Enterprise is aggressively preparing the SLS, Orion Multi-Purpose Crew Vehicle (Orion), and the Exploration Ground Systems (EGS) needed to provide the foundational elements required for Deep Space Exploration. NASA recognizes the challenges of pursuing concurrent development of these three programs and has made substantial progress toward demonstrating these capabilities within the context of a capabilities-driven architecture.

ESD has established a proactive affordability initiative that each program has implemented to find ways to avoid the need for greater expenditures in the development phase of the program. This has resulted in tens of millions of dollars in cost avoidance both now and in the future. The fact that we are adapting existing hardware, facilities, and designs in the ESD Enterprise actually reduces the overall need for and cost of design reviews and testing. A recent audit of the SLS program by the Government Accountability Office[1] (GAO) noted that the program's technical issues were not overly complex, and that management systems were in place to address them.

[1] "Space Launch System: Resources Need to be Matched to Requirements to Decrease Risk and Support Long Term Affordability" GAO-14-631: Published: Jul 23, 2014. Publicly Released: Jul 23, 2014.

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The evolvable nature of SLS (and by extension the other exploration programs) is consistent with procurement best-practices for buying down program risk; likewise, evolvability is a key component of the capability-driven architecture. These exploration programs are designed to enable multi-decade human exploration beyond low-Earth orbit in support of national objectives and policy. The requirements for a safe and reliable human exploration transportation system (particularly in terms of lift capacity and volume) are significantly greater than for non-exploration missions. Taken together, the capability-based framework and the evolvable architecture provides the foundation for a sustainable approach to exploration. From this strategy, NASA has identified conceptual missions that provide defined minimum capabilities for SLS (such as required mass delivered to lunar or Martian orbit), while the basic timing of those missions (operating in cis-lunar space through the 2020s, with missions to the Mars vicinity in the 2030s) drives when upgraded capabilities are required. Funding instability and uncertainty remains our number one challenge to success, resulting in limited options to accelerate or modify our development approach.

2. Managing NASA's Science Portfolio

The Science Mission Directorate (SMD) recognizes the inherent difficulties in developing and operating its extensive portfolio of projects and programs in today's fiscally constrained environment. Still, SMD develops and implements the cutting-edge missions necessary to advance science and produce the incredible discoveries for which NASA has long been recognized.

Our scientific missions are inherently complex and present unique challenges, as most represent significant first-of-a kind achievements. But with these challenges, it is increasingly important to execute SMD's missions on time and within budget. In the 2010 Science Plan for NASA's Science Mission Directorate, SMD outlined the Agency's efforts to revise and implement new policies to constrain mission costs and meet schedule goals. These measures include:

- Establishing confidence level-based mission life-cycle budgets
- Obtaining independently generated internal and external cost estimates
- Reviewing projects at multiple, formal Key Decision Points that function as gates to the next stage of development

Additionally, NASA has started requiring the Decadal Survey committees to perform independent cost estimates for their proposed mission concepts. By adhering to these steps over the past six years, NASA has launched many missions within their cost and schedule baselines, demonstrating measurable progress in improving the Agency's mission cost estimation and management tools.

This record of cost and schedule performance for SMD is unprecedented. The Van Allen Probes (formerly known as the Radiation Belt Storm Probes [RBSP]), Juno, Gravity Recovery and Interior Laboratory (GRAIL), Mars Atmosphere and Volatile Evolution (MAVEN) mission, Landsat Data Continuity Mission (LDCM)/Landsat 8, and the Global

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Precipitation Measurement (GPM) mission were all executed within the original budget commitments made to stakeholders. The GAO in its 2014 report[2], "NASA: Assessments of Selected Large-Scale Projects" noted, "*The [NASA] total portfolio of major projects saw cost and schedule growth that remains low compared to GAO's first review of the portfolio.*"

In the case of the James Webb Space Telescope (JWST) which was rebaselined in 2011, the GAO stated in its 2014 report[3], "The James Webb Space Telescope (JWST) project is generally executing to its September 2011 revised cost and schedule baseline...." SMD will continue to rigorously maintain these practices to improve schedule and cost performance.

Over the past year the NASA OIG issued several reports and reviews focused on SMD activities, including SOFIA, the NEO program, ICESat-2, and the Mission Extension Process. In the context of these reports SMD has agreed to take corrective actions and appreciates the opportunity to make incremental improvements to its processes and programs.

3. Ensuring the Continued Efficacy of the Space Communications Networks

In 2006, NASA initiated the Space Communications and Navigation (SCaN) Program to create an integrated Agency-wide space communications and navigation architecture to assure continue efficacy of the Agency's space communication networks. The evolution of the integrated system will take place in phases through the SCaN Network Integrated Project which currently is in pre-phase A. The Near Earth Network, Space Network and Deep Space Network initially will remain independent. In the interim, SCaN is adding new capabilities that extend the functionality of the networks and will be incorporated into the integrated architecture.

The SCaN Program has been providing communications, navigation, and delivery of data to space flight missions for over 30 years of uninterrupted service. As the OIG noted the current satellite communications systems are aging and increasingly difficult to repair, thus SCaN has addressed these challenges through three separate activities that are all underway:

- Adding a new generation of communication satellites (the Tracking and Data Relay Satellites [TDRS] project) to the Space Network fleet;
- Upgrading Space Network ground infrastructure through Space Network Ground Segment Sustainment (SGSS) Project, and;
- Upgrading the deep space communication capability through Deep Space Aperture Enhancement Project (DAEP).

SCaN also manages NASA's Spectrum Management Program (SMP) and is deeply involved with other space-faring nations in this area. SMP ensures that all NASA activities comply

[2] "NASA: Assessments of Selected Large-Scale Projects" GAO-14-338SP: Published: Apr 15, 2014. Publicly Released: Apr 15, 2014.

[3] "James Webb Space Telescope: Project Meeting Commitments but Current Technical, Cost, and Schedule Challenges Could Affect Continued Progress" GAO-14-72: Published: Jan 8, 2014. Publicly Released: Jan 8, 2014.

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with national and international laws applicable to the use of the electromagnetic spectrum. The program continues to address competing interests for use of the electromagnetic spectrum, including emerging commercial broadband services, to assure necessary spectrum resources are available for NASA missions.

SCaN manages the communication and navigation standards program to assure cross-utilization of both ground infrastructure and spacecraft between the U.S. and our partner nations.

Lastly, SCaN is focused on developing technology to raise the communication capability to the next plateau, that being optical communication. With the exceptional success of the recently completed Lunar Laser Communication Demonstration project, SCaN is well positioned to continue development toward an optical communication operational capability within a decade.

4. Overhauling NASA's Information Technology Governance

Continuing to improve Information Technology (IT) governance structure in response to the eight recommendations in the OIG's June 2013 report is an Office of the Chief Information Officer (OCIO) fiscal year 2015 priority. On December 6, 2013, the NASA Chief Information Officer (CIO) presented a Phase 2 IT Governance model decision package to the Mission Support Council (MSC). The MSC approved implementation of Phase 2 of IT Governance, providing the NASA CIO increased visibility into Center Institutional IT investment planning and execution beginning in FY2016. The implementation plan was presented to the MSC in March of 2014 and the NASA CIO participated in Center IT budget formulation activities for FY 2016. The IT governing board structure and charters, as well as Mission Directorate IT representative roles and responsibilities, will be updated as changes to the IT Governance structure are approved, based on findings from the initial FY2016 formulation activities. In January 2014, the NASA CIO hired an IT Governance Lead to facilitate management and implementation of related NASA IT Governance decisions and actions to help ensure a committed focus on strengthening NASA's IT governance model.

5. Ensuring the Security of NASA's Information Technology Systems

Advancing NASA's IT security posture in response to ever-growing threats and attack vectors remains a priority for the Agency, as demonstrated by increased funding for IT security efforts in FYs 2014-2016. NASA is taking a holistic approach, through continuous monitoring and mitigation, to network, system and information protection by overcoming barriers to ensure efficient and effective management of the Agency's IT assets. Many of these barriers include malicious software, unauthorized access to Agency's computers, and connectivity to partner organizations. To continue building a more solid IT security framework, NASA completed, or is in the process of implementing, several improvements, such as upgrading our intrusion detection systems. Also in FY 2014, we introduced the first intrusion prevention systems at the NASA Trusted Internet Connection (TIC) location (currently in its final stages of deployment). Additionally, the CIO is working across the Agency to reduce NASA's web footprint presence by eliminating unused and duplicative

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web applications that increase our attack surface. Finally, we are enhancing our collaboration across Centers \ Mission areas and with external organizations. As budget allows, the Agency will continue to take corrective action to address the highest priority IT security needs and recommendations.

6. Managing NASA's Infrastructure and Facilities

NASA recognizes that managing its technically unique infrastructure is a top management challenge. NASA continues to implement its strategy to reduce and modernize its infrastructure within available and anticipated budget levels.

Eliminating Unneeded Facilities: NASA's demolition program has been active since 2004 and has provided consistent, dedicated funding to demolishing unneeded facilities. From 2012 through 2014 NASA demolished 209 facilities, eliminating almost 1.3 million square feet of unneeded facilities. In addition, NASA transferred or otherwise disposed of 442,000 square feet of unneeded facilities. NASA continues to work on the disposal of the Santa Susana Field Laboratory (SSFL), initiating building demolition this year. NASA has eliminated unneeded leased facilities, ending leases in Huntsville in 2013, and a leased facility in Los Angeles in 2014. NASA is completing a consolidation project at the Jet Propulsion Laboratory (JPL) so that NASA can terminate additional leased space in Los Angeles in 2015. NASA has incorporated Federal "Freeze the Footprint" requirements into its strategy to reduce unneeded infrastructure. In 2013, NASA reduced its office and warehouse space by 1.6 percent from the Agency's 2012 baseline. In 2014, NASA is on track to reduce its baseline well below the Agency's original plan.

Consolidation and Modernization: NASA is continuing its strategy of refurbishing, consolidating, and replacing key facilities within expected budget limits. NASA completed construction of several key replacement facilities such as the Central Communications Facility at Stennis Space Center (SSC), the Mission Integration Center and Logistics Facility at Glenn Research Center (GRC), the central office building at Marshall Space Flight Center (MSFC), and the Facility Support Center at Armstrong Flight Research Facility (AFRC). These facilities facilitate consolidation of functions and net reduction in facility square footage. Assessments of the facilities after construction confirm that the facilities operate with overall lower operating costs than the facilities they replaced. NASA completed construction of a central parking structure at JPL, allowing NASA to end its parking lease with the City of Pasadena and return the parking site to green space. Annual facility assessments estimate that NASA's deferred maintenance, which is an estimate of the essential but unfunded maintenance work necessary to bring all facilities up to normal operating standard, decreased 4.1 percent between 2011 and 2014. The assessment identified demolition and replacing major facilities as dominant factors in condition improvement and deferred maintenance reduction in parts of NASA's infrastructure.

Property Partnerships: NASA is partnering with the private sector and with other agencies to make underutilized NASA facilities available to others when the facilities can support U.S. aerospace initiatives. These partnering agreements defray some of the cost

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of operating NASA's infrastructure. When Enhanced Use Leases (EUL) or National Historic Preservation Act Leases are used, proceeds from the leases are used to maintain, repair, and modernize NASA's infrastructure. NASA is in the process of revising its policy and guidance on public/private partnerships to capture best practices in developing these agreements.

Maintenance: Adequately maintaining facilities in the current constrained budget environment is a challenge. Rising utility, labor, and material costs put increasing pressures on level or decreasing facilities budgets. NASA has increased its focus on maintenance of facilities by reallocating resources to this critical activity. Additionally, ongoing efforts to reduce energy costs, demolish unneeded infrastructure, and renew and consolidate into fewer, more efficient facilities are helping to focus facility maintenance funds on maintenance of critical facilities. In an effort to improve savings, NASA's Centers are making small investments in remote monitoring of equipment to reduce the number of field inspections required. Proceeds from EULs support maintenance, repairs, and energy projects across the Agency. NASA is currently developing a lease agreement using the National Historic Preservation Act which will permit commercial use and operation of a historic property. Funds from this lease will be used for the restoration of the facility and support stewardship of other historic properties across the Agency.

Reducing Costs at the Independent Validation and Verification (IV&V) Facility: In response to the OIG's July 2014 audit, NASA is evaluating alternatives for reducing operating costs at the IV&V.

Technical Capabilities Assessments: NASA has established a disciplined approach to strategically perform an assessment of its technical capabilities, both workforce and assets. The objective of the Technical Capability Assessment Team (TCAT) effort is to establish a more efficient operating model for the Agency that maintains critical capabilities across NASA's Centers and meets current and future mission needs. This approach is enabling NASA leadership to make informed decisions on investing/divesting strategically within the budget, while strengthening innovation in critical areas needed to advance the Nation into the next half-century of achievement in aeronautics and space. NASA's TCAT assessment and decision process will take place predominantly in calendar year 2014, but full implementation of each decision could take multiple years, depending on the complexity of a particular decision. By the end of 2014, NASA will fully institutionalize the TCAT process, thus putting in place a long-term approach to Agency capability leadership.

NASA's Capability Leadership Model, once in place by the end of CY2014, will focus on four key areas, which will be reviewed annually for continued progress:

- Building a strong foundation to support all Agency near- and far-term missions
- Advancing capabilities to meet long-term needs
- Optimizing deployment of capabilities across all Centers
- Divesting in facilities and workforce skills that are no longer needed

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Technical Capability Assessment Decisions To Date: NASA's MSC has made decisions on six technical capability decision packages, totaling over $800 million dollars in annual costs and over 2,300 persons in the workforce (Civil Service and contractor), including: Balloons, Microgravity Services, Aircraft Operations, Earth Science Research and Analysis, Life Sciences Research, and Human Factors. This has resulted in proposed reinvestment of an estimated annual savings of approximately $50 million towards Aeronautics, Science, and Human Exploration priorities depending on the implementation of the decision recommendations. Implementation actions will be tracked by the MSC. All decisions and options considered are posted internally on the TCAT Web site for employees and distributed to outside stakeholders.

Technical Capability Assessments Scheduled to Complete in CY 2014: The annual cost of technical capabilities currently being assessed and scheduled for completion by the end of CY2014 will be well over $2 billion annually with well over 6,000 in workforce, with significant opportunity for divestment and reinvestment in advancing technical capabilities.

Assessments and decisions that are underway and scheduled for completion by the end of CY2014:

- Mission Operations
- Nuclear Power/Propulsion
- Entry, Aerocapture, Aerobraking, Descent, and Landing
- Space Environments & Natural Environments Test
- Instrument & Sensors
- Propulsion
- Ascent Transportation – Vehicle
- Extra-Terrestrial (ET) Surface Systems (e.g., In Situ Resource Utilization [ISRU])
- Arrival Transportation – Acquisition, Rendezvous, & Docking
- Aerosciences
- Materials

7. Ensuring the Integrity of the Contracting and Grants Process and Proper Use of Space Act Agreements

NASA's Office of Procurement (OP) appreciates the investigative and audit work cited by the OIG and acknowledges the importance of this effort, particularly where fraud is uncovered and process improvements can be made.

NASA procurement is continuing to strengthen and improve contracting and grants processes throughout the Agency. For the areas specifically identified by the OIG we have revised the strategic sourcing plan and strategic sourcing governance structure. We have made significant strides in strengthening the contract and grants closeout processes and will be publishing guidance on this subject to establish standards for closeout. We have

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strengthened training in the award fee process and believe NASA's approach to award fee is sound and compliant with the Federal Acquisition Regulation and statute. Finally, we are undertaking a significant effort to strengthen the management of grants through the implementation of the Office of Management and Budget's (OMB) Uniform Administrative Requirements for Federal Awards, which the OMB intends to publish by the end of the calendar year.

We appreciate the findings and recommendations articulated in the OIG's June 2014 report, "NASA's Use of Space Act Agreements" (IG-14-020), and continue to aggressively work towards the implementation of those recommendations through the corrective actions that we have embarked upon. We believe that these corrective actions, once completed, will improve NASA's overall management of Space Act Agreements (SAAs), as well as the underlying processes and procedures.

NASA has also taken other significant actions to improve increasing transparency, accountability, and oversight in regard to SAAs and other similar partnership agreements. For example, the Agency established a NASA Partnership Council (PC) in December 2013. The PC is chaired by the Deputy Administrator (currently chaired by the NASA Chief of Staff while the Deputy Administrator role is vacant) and is responsible for improving the Agency's partnership approval process, helping to ensure that Agency partnerships are aligned with internal and external guidance and policy, and adjudicating partnership issues that cannot be resolved at lower levels. Also, in February 2014, the Agency established a Partnership Office of Primary Responsibility (OPR) within the Mission Support Directorate. The Partnership OPR supports the PC and performs a central role for the Agency in regard to partnership guidance, operations, and advocacy/awareness functions, in coordination with other Agency stakeholder organizations.

APPENDIX B: NASA RECIPIENTS

Office of the Administrator

Administrator
Associate Administrator
Deputy Associate Administrator
Chief of Staff
Associate Deputy Administrator
Associate Deputy Administrator, Strategy and Policy Implementation
White House Liaison

Administrator Staff Offices

Chief Financial Officer
Chief Information Officer
Chief Engineer
Chief Health and Medical Officer
Chief Safety and Mission Assurance
Chief Scientist
Chief Technologist
General Counsel
Associate Administrator for Communications
Associate Administrator for Diversity and Equal Opportunity
Associate Administrator for Education
Associate Administrator for International and Interagency Relations
Associate Administrator for Legislative and Intergovernmental Affairs
Associate Administrator for Small Business Programs

Mission Directorates

Associate Administrator for Aeronautics Research Mission Directorate
Associate Administrator for Human Exploration and Operations Mission Directorate
Associate Administrator for Science Mission Directorate
Associate Administrator for Space Technology Mission Directorate
Associate Administrator for Mission Support Directorate
- Assistant Administrator for Human Capital Management
- Assistant Administrator for Procurement
- Assistant Administrator for Protective Services
- Assistant Administrator for Strategic Infrastructure
- Executive Director, Headquarters Operations
- Executive Director, NSSC
- Director, NASA Management Office
- Acting Director, Internal Controls and Management Systems

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NASA Centers

Director, Ames Research Center
Director, Armstrong Flight Research Center
Director, Glenn Research Center
Director, Goddard Space Flight Center
Director, Jet Propulsion Laboratory
Director, Johnson Space Center
Director, Kennedy Space Center
Director, Langley Research Center
Director, Marshall Space Flight Center
Director, Stennis Space Center

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FY 2014 Inspector General Act Amendments Report

Background

In accordance with the Inspector General Act Amendments of 1988 (P.L. 100-504), agency heads are required to submit semi-annual reports to Congress on the actions taken in response to Office of Inspector (OIG) audit, evaluation, and inspection reports.

Specifically, the Act requires:

1. Disclosure of OIG reports which contain findings with monetary benefits (i.e., disallowed costs and funds put to better use):
   - For which management decisions were made during the reporting period (FY 2014);
   - For which final management decisions have been made, but final management action is still pending;
   - For which final management action was taken during the reporting period, and;
   - For which no final management action was taken during the reporting period; and

2. Disclosure of OIG recommendations pending final management action more than one year after the issuance of the associated audit report.

In addition to the requirements outlined in the Inspector General Act Amendments of 1988, the Office of Management and Budget (OMB) has issued specific action requirements to federal agencies in their Circular No. A-50, "Audit Follow-up." These requirements include that federal agencies ensure that final management decisions on audit recommendations are reached within six months after an OIG audit report is issued and that related corrective actions associated with the final management decision begin as soon as practicable.

The Reports Consolidation Act of 2000 (P.L. 106-531), affords federal agencies with the flexibility to consolidate and annualize the required semi-annual Inspector General Act Amendments reporting elements for inclusion in NASA's annual Agency Financial Report (AFR).

The following definitions are provided to enhance the readability of NASA's FY 2014 Inspector General Act Amendments Report:

Final Management Decision is reached when management evaluates the OIG's findings and recommendations, and determines whether or not to implement a proposed recommendation.

Final Management Action is the point in time when corrective action, taken by management in conjunction with a final management decision, is completed.

Corrective Action consists of remediation efforts on the part of management which are intended to mitigate an audit finding.

Questioned Costs are costs identified by the OIG as being potentially unallowable or unallowable because of: a) a purported violation of law, regulation, contract, grant, cooperative agreement, or other device governing the incurrence of cost; b) a finding that, at the time of the audit, such cost is not supported by adequate documentation, or; c) a finding that the cost incurred for the intended purpose is unnecessary or unreasonable.

Disallowed Costs are questioned costs that management has sustained or agreed should not be charged to the Government.

Funds Put to Better Use **(FPTBU)** represent potential cost savings that could be realized through the implementation of an audit recommendation.

NASA's Audit Follow-up Program

NASA's audit follow-up program is an integral component of the Agency's integrated internal control framework, and is a key element in improving the overall efficiency and effectiveness of NASA's programs, projects and operations. NASA is firmly committed to ensuring timely and responsive final management decisions, along with timely and complete final management action, on all audit recommendations issued by the NASA OIG. To this end, NASA has implemented a comprehensive program of audit follow-up intended to ensure that audit recommendations issued by the OIG are resolved and implemented in a timely, responsive, and effective manner.

NASA's Office of Internal Controls and Management Systems (OICMS) is designated as the Agency's office of primary responsibility for policy formulation, oversight, and functional leadership of NASA's audit follow-up program. OICMS implements program activities through an agency-wide network of Audit Liaison Representatives (ALRs) who, in turn, are responsible for executing program activities at the Mission Directorate, Field Center and Headquarters Office level. OICMS, in conjunction with NASA's network of ALRs, provide the functional structure to support NASA's audit follow-up program. Program activities are tracked, monitored and reported utilizing NASA's Audit and Assurance Information Reporting System (AAIRS). AAIRS is a web-based tracking and reporting tool managed by OICMS to monitor key activities and milestones associated with audits performed by the OIG.

In accordance with requirements contained in OMB Circular A-50, "*Audit Follow-up*," OICMS monitors audit recommendations issued by the OIG to ensure that a final management decision is reached within six months of the issuance of a final OIG audit report, where practicable. A final management decision is reached when either: a) management agrees to implement corrective actions in response to an OIG audit recommendation; or b) management determines that implementing a particular audit recommendation is imprudent, impractical, not cost beneficial, etc. In those instances where agreement between the OIG and NASA management cannot be reached, resolution will be sought from NASA's Audit Follow-up Of-

ficial (AFO).

Once a final management decision has been made to implement an audit recommendation, corrective action on the part of management is pursued as rapidly as practicable, in accordance with provisions of OMB Circular A-50. In some instances, the corrective action associated with a final management decision spans multiple fiscal years due factors such as the complexity or cost of the planned corrective action; or unforeseen delays in the formulation, review and approval of NASA policies, procedural requirements, or regulations.

FY 2014 Audit Follow-up Results

The Inspector General Act Amendments of 1988 require that heads of federal agencies report on actions taken or remaining to be taken, in response to OIG audit reports containing monetary findings. The amendments also require that management report on those OIG recommendations for which a final management decision had been made in a prior reporting period (previous fiscal year), but where final management action is still on-going. In addition to the statutory reporting requirements delineated in the Inspector General Act Amendments of 1988, OMB Circular A-50, requires that final management decisions on OIG audit recommendations be made within six months of the issuance of a final audit report.

NASA's reporting in conjunction with the requirements of the Inspector General Act Amendments of 1988 and OMB Circular A-50 follows:

1. OIG Audit Reports with Monetary Findings

During FY 2014, the OIG issued three audit reports with monetary findings[1], specifically: $3.2 million in questioned costs and $121 million in FPTBU, requiring management disposition during FY 2014. Although the OIG issued no audit reports containing monetary findings during FY 2013, $216,920[2] in questioned costs identified during FY 2012 remained undispositioned at the beginning of FY 2014. Total questioned costs subject to management disposition in FY 2014: $3.4 million. Total FPTBU subject to management disposition in FY 2014: $120 million (see Table 1).

Management dispositioned $3.2 million of the total $3.4 million in OIG identified questioned costs during FY 2014. The remaining $216,920 in undispositioned questioned costs carried over from FY 2012 is scheduled for management disposition in November 2014. Management dispositioned $111 million in OIG identified FPTBU during FY 2014, with $9.6 million pending management disposition in FY 2015.

[1] "*NASA's Use of Award Fee Contracts*" (IG-14-003; November 19, 2013) - Recommendations 3, 6, and 8; "*NASA's Award Closeout Process*" (IG-14-014) - Recommendation 3; and "*NASA's Independent Verification and Validation Program*" (IG-14-024) - Recommendation 1.

[2] "*Audit of NASA Grants Awarded to the Philadelphia College Opportunity Resources for Education*" (IG-12-018; July 26, 2012) - Recommendations 4 and 5.

Audit Reports with Monetary Benefits (Questioned Costs and Funds Put to Better Use) *For the Year Ended September 30, 2014*					
	Category	Questioned Costs		Funds to be Put To Better Use	
		Number of Reports	(Dollars)	Number of Reports	(Dollars)
Line 1	Audit reports with monetary benefits issued in prior years (FY 2012) that required disposition by management in FY 2014 (prior year carry-over)	1	$216,920	0	$0
Line 2	Plus: Audit reports with monetary benefits issued in FY 2014 that required disposition by management during FY 2014	1	$3,236,530	3	$120,675,039
Line 3	Total audit reports with monetary benefits (prior year and current year) that required disposition by management in FY 2014 [line 1 + 2]	2	$3,453,450	3	$120,675,039
Line 4	Audit reports with monetary benefits on which management disposition was completed during FY 2014	2	$3,236,530	2	$111,022,019
Line 5	Audit reports with monetary benefits still pending disposition by management at the end of FY 2014 [line3-4] (carry-over into FY 2015)	1	$216,920	1	$9,653,020

Table 1

2. OIG Audit Recommendations Open More Than One Year After Report Issuance

As of September 30, 2014, there were 15 OIG audit reports issued in prior fiscal years containing a total of 50 audit recommendations pending final management action more than one year after the issuance of the related OIG audit report (see Table 2).

Although these 50 recommendations remain open more than one year after issuance of the respective audit reports, NASA management continues to aggressively pursue agreed-upon corrective actions. In summarizing these 51 open prior year recommendations, four general categories of outstanding corrective actions were identified:

1. Policy Development/Revision (for 20 outstanding recommendations);
2. Program/ Project Operations (for 20 outstanding recommendations);
3. Oversight/ Monitoring/Program Review (for 8 outstanding recommendations); and
4. Recovery of Questioned Costs (for 2 outstanding recommendations)

By way of comparison, for the fiscal year ended September 30, 2013, there were 20 OIG audit reports containing 59 recommendations on which final management decisions were made but final management action was still pending. For the five year period ended September 30, 2014, the number of OIG audit recommendations pending final management action one year or more after issuance of a final audit report has ranged between 33 and 59.

Summary of OIG Audit Reports Pending Final Management Action One Year or More After Issuance of a Final Report *(As of September 30, 2014)*				
Report No. (Report Date)	Report Title	No. of Recommendations		
		Open	Closed	Total
IG-10-013 (5/13/2010)	*Review of the Information Technology Security of the Internet Protocol Operational Network (IONet)*	1	1	2
IG-11-017 (3/28/2011)	*Inadequate Security Practices Expose Key NASA Network to Cyber Attack*	1	2	3
IG-11-024 (8/4/2011)	*NASA Infrastructure and Facilities: Assessment of Data Used to Manage Real Property Assets*	1	2	3
IG-11-026 (9/12/2011)	*NASA's Grant Administration and Management*	5	4	9
IG-12-013 (3/1/2012)	*Audit of NASA's Process for Transferring Technology to the Government and Private Sector*	2	4	6
IG-12-016 (6/22/2012)	*Audit of NASA Grants Awarded to the Alabama Space Science Exhibit Commission's U.S. Space and Rocket Center*	1	0	1
IG-12-017 (8/7/2012)	*Review of NASA's Computer Security Incident Detection and Handling Capability*	3	0	3
IG-12-018 (7/26/2012)	*Audit of NASA Grants Awarded to the Philadelphia College Opportunity Resources for Education*	4	4	8
IG-12-019 (8/3/2012)	*Audit of NASA Grant Awarded to the HudsonAlpha Institute for Biotechnology*	2	6	8
IG-12-020 (8/9/2012)	*NASA's Infrastructure and Facilities: An Assessment of the Agency's Real Property Leasing Practices*	6	2	8
IG-13-006 (3/18/2013)	*NASA's Process for Acquiring Information Technology Security Assessment and Monitoring Tools*	3	1	4
IG-13-008 (2/12/2013)	*NASA's Efforts to Reduce Unneeded Infrastructure and Facilities*	5	0	5
IG-13-015 (6/5/2013)	*NASA's Information Technology Governance*	8	0	8
IG-13-020 (7/18/2013)	*Audit of Selected NASA Conferences in Fiscal Years 2011-2012*	4	1	5
IG-13-021 (7/29/2013)	*NASA's Progress in Adopting Cloud-Computing Technologies*	4	2	6
15	**Totals**	**50**	**29**	**79**

Table 2

3. Final Management Decisions Not Made Within Six Months of a Report Date

During FY 2014, the OIG issued 27 reports containing 162 recommendations addressed to NASA which required a final management decision within six months of the respective final report dates. No prior year (FY 2013) final management decisions were outstanding as of September 30, 2014.

Of the 162 FY 2014 OIG audit recommendations requiring a final management decision during FY 2014, final management decisions on two recommendations[3] remain outstanding as of September 30, 2014. Management and the OIG have agreed to defer determination of a final management decision on these two recommendations until November 2014[4] . Additionally, final management decisions on six recommendations were made in excess of six months after the issuance of the final report [5], but were made prior to September 30, 2014.

For the five year period ended September 30, 2014, final management decisions on eight recommendations were made in excess of six months after the issuance of a final report date.

[3] "NASA's Use of Award Fee Contracts" (IG-14-003; November 19, 2013) - Recommendations 7 and 8.

[4] On May 12, 2014 NASA's Audit Follow-up Official and the OIG agreed to defer determination of a final management decision pending release of a Government Accountability Office (GAO) report on NASA's James Webb Space Telescope (JWST) expected in November 2014.

[5] "NASA's Use of Award Fee Contracts" (IG-14-003; November 19, 2013) - Recommendations 1, 2, 4, 6, 10 and 11.

4. Audit Recommendation Closure Efficiency

During FY 2014, 154 OIG-issued audit recommendations, including 146 recommendations issued in prior fiscal years, were closed based on responsive management action. Of these 154 recommendations:

- 20 recommendations (13 percent) were closed within one year of issuance of the associated audit report;
- 119 recommendations (77 percent) were closed between one and two years of issuance of the associated audit report and;
- 15 recommendations (10 percent) were closed in excess of two years of issaunce of the associated audit report (see Table 3)

For comparative purposes, during FY 2013, a total of 157 OIG-issued audit recommendations (including 152 recommendations issued in prior fiscal years) were closed based on responsive management action, with 85 recommendations (54 percent) closed within one year of the issuance of the associated audit report; 60 recommendations (38 percent) closed within two years of the issuance of the associated audit report; and 12 recommendations (8 percent) closed in excess of two years after issuance of the associated audit report.

For the five year period ended September 30, 2014, an average of 43 percent of OIG-issued audit recommendations were closed within one year of issuance of the assocated audit report; 46 percent were closed within two years of issance of the assocated audit report, and 11 percent were closed in excess of two years of issuance of the associated audit report.

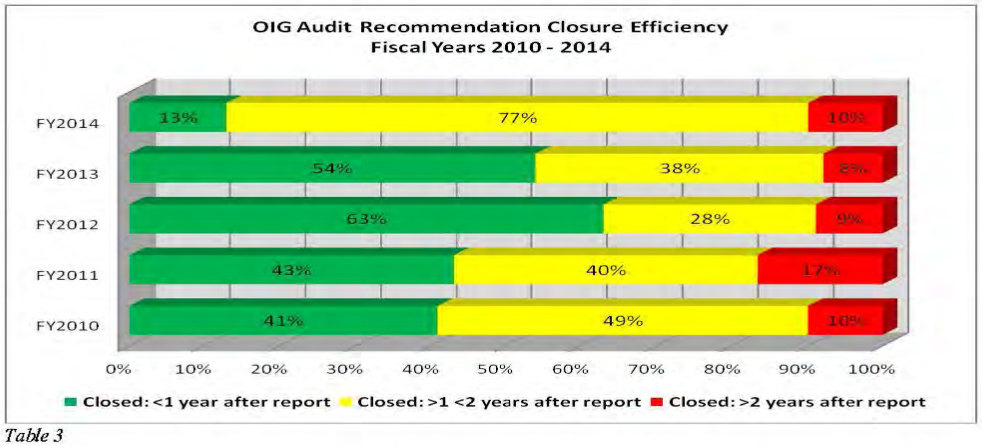

Table 3

Improper Payments Information Act (IPIA) Assessment

Improper Payments Information Act (IPIA) Assessment

The National Aeronautics and Space Administration (NASA) is dedicated to reducing fraud, waste and abuse by adequately reviewing and reporting programs susceptible to improper payments in accordance with the Office of Management and Budget (OMB) Circular A-123 *Management's Responsibility for Internal Control,* Appendix C, *Requirements for Effective Measurement and Remediation of Improper Payments*. To improve the integrity of the Federal government's payments and the efficiency of its programs and activities, Congress enacted the Improper Payments Information Act (IPIA) of 2002 (Public Law (P.L.) 107-300). The IPIA contains requirements in the areas of improper payment identification and reporting. It requires agency heads to annually review all programs and activities, identify those that may be susceptible to significant improper payments, estimate annual improper payments in susceptible programs and activities, and report the results of their improper payment activities.

The Improper Payments Elimination and Recovery Act (IPERA) amended the IPIA and generally repealed the Recovery Auditing Act (Section 831, Defense Authorization Act, for FY 2001; P.L. 107-107). Subsequently, OMB issued Memorandum M-11-16 (*Issuance of Revised Parts I and II to Appendix C of OMB Circular A-123*) modifying Circular A-123 Appendix C, Part I and Part II (which was issued in August 2006 as OMB Memorandum M-06-23). OMB Memorandum M-11-16 requires each Executive branch agency to:

- Review all of its programs and activities to identify those susceptible to significant improper payments. OMB defines significant improper payments as gross annual improper payments (i.e., the total amount of overpayments plus underpayments) in the program exceeding (1) both 1.5 percent of program outlays and $10,000,000 of all program or activity payments made during the fiscal year reported or (2) $100,000,000 (regardless of the improper payment percentage of total program outlays).

- Obtain a statistically valid estimate of the annual amount of improper payments in programs and activities for those programs that are identified as susceptible to significant improper payments.

- Implement a plan to reduce improper payments.

- Report estimates of the annual amount of improper payments in programs and activities and progress in reducing them.

The Improper Payments Elimination and Recovery Improvement Act of 2012 (IPERIA), P.L. 112-248, became law on January 10, 2013 and was designed to amend and improve on IPERA (Public Law No. 111-204). IPERIA requires agencies to determine improper pay-

ments, improve recovery of improper payments, and reinforces and accelerates the President's "Do Not Pay" efforts.

Furthermore, on January 29, 2013, the President signed into law the Disaster Relief Appropriations Act, (P.L. 113-2 (127 Stat. 4) (Act)), which provides aid for Hurricane Sandy disaster victims and their communities. The Act requires Federal agencies supporting Sandy recovery and other disaster-related activities to implement additional internal controls to prevent waste, fraud, and abuse of these funds. Section 904(b) of the Act provides that all programs and activities receiving funds under this Act shall be deemed to be "susceptible to significant improper payments" for the purposes of IPIA, notwithstanding IPIA section 2(a). This requires all Federal programs or activities receiving funds under this Act to be automatically considered susceptible to significant improper payments, regardless of any previous improper payment risk-assessment results, and are required to calculate and report an improper payment estimate. The OMB issued Memorandum M-13-07 (*Accountability for Funds Provided by the Disaster Relief Appropriations Act*) to provide guidance for the Act.

The IPIA defines an improper payment as any payment that should not have been made or that was made in an incorrect amount (including overpayments and underpayments) under statutory, contractual, administrative, or other legally applicable requirements. It includes any payment to an ineligible recipient, any payment for an ineligible service, any duplicate payment, payments for services not received, and any payment that does not account for credit for applicable discounts. Moreover, when an agency's review is unable to discern whether a payment is proper as a result of insufficient or lack of documentation, this payment must also be considered an improper payment.

Throughout the past eight years, NASA has diligently met IPIA program compliance by executing OMB-compliant risk assessments, reviewing and updating NASA payment process documentation, selecting OMB-compliant statistical samples for testing, drafting comprehensive test procedures, reporting results in the annual Agency Financial Report (AFR) formerly the Performance and Accountability Report (PAR), and documenting the IPIA review process and results. NASA has reviewed its programs annually and has not identified significant improper payments for any of its programs. This is evidenced by NASA's extensive improper payment test results.

NASA performed its FY 2014 IPIA review on FY 2013 disbursements and found no high risk programs. However, OMB deemed "Hurricane Sandy Relief" as a high risk program, but during FY 2013, no disbursements were made related to Hurricane Sandy disaster relief funds. Therefore, for the FY 2014 review no Hurricane Sandy payments were tested. However, for the FY 2015 review, NASA will test and report on Hurricane Sandy payments made in FY 2014 as required in OMB issued Memorandum M-13-07.

Risk Assessment

To conduct the FY 2014 IPIA assessment, NASA considered lessons learned from past IPIA

assessments, including NASA's OIG recommendations, and enhanced the prior year risk assessment methodology.

NASA's risk assessment methodology was developed using criteria established for determining levels of risk and evaluating all major programs against this criteria. All OMB risk factors were considered as well as conditions related to financial processing and internal controls, internal and external monitoring and assessments, human capital risk, operating environment and volume of payments.

In FY 2014, NASA performed a comprehensive qualitative and quantitative risk assessment to identify programs susceptible to high risk of significant improper payments. NASA's risk assessment methodology is illustrated in **Table 1** below, along with a brief summary of steps and results.

Table 1: NASA's Risk Assessment Methodology and Results

Identify Programs Eligible for Assessment	Validate Programs Identified	Perform Risk Assessment
• Identified – 121 Programs encompassing $16.9B in FY 2013, some of which were combined resulting in 93 • Estimated maximum error rate of program disbursements at 12.5% • Set materiality level for low risk programs at <$84M	• Reviewed NASA budget submissions • Cross-walked programs identified to NASA budget information	• Evaluated FY 2013 audit reports, findings and recommendations • Evaluated internal control results • Evaluated risk conditions including control environment, human capital risk, operating environment and volume of payments • Reviewed agency budget trends • Updated risk assessment based on information gathered from NASA financial management reports and independent reviews • Conducted survey using all the OMB M-11-16 risk factors • Populated risk assessment matrix with feedback from OMB based risk factor questionnaire • No high risk programs identified based on risk ratings

1. Identify Programs Eligible for Assessment

To determine the scope of Programs subject to the Risk Assessment, NASA prepared a comprehensive list based on the FY 2013 total disbursements, identifying 121 Programs. NASA generated and provided the disbursement totals for each Program from its financial management system.

A review of the 121 Programs some of which were combined and resulting in 93 Programs[1] subjected to further analysis.

2. Validate Programs Identified

All amounts identified via the disbursement file were confirmed as NASA Programs by reviewing the approved Agency budget, and matching identifying data from the accounting system to Programs officially recognized by NASA and Congress in the budget.

3. Prepare Risk Assessment

The control environment, internal and external monitoring, human capital risk, operating environment and volume of payments risk conditions were analyzed during the risk assessment in conjunction with the following risk factors identified by OMB in M-11-16, Part I Section 7, Step 1b (pgs. 5 – 6):

a) Whether the program or activity reviewed is new to the agency;
b) The complexity of the program or activity reviewed, particularly with respect to determining correct payment amounts;
c) The volume (dollar value or amount) of payments made annually;
d) Whether payments or payment eligibility decisions are made outside of the agency;
e) Recent major changes in program funding, authorities, practices, or procedures;
f) The level, experience, and quality of training for personnel responsible for making program eligibility determinations or certifying that payments are accurate;
g) Significant deficiencies in the audit reports of the agency including, but not limited to the agency Inspector General or the Government Account ability Office (GAO) report audit findings, or other relevant management findings that might hinder accurate payment certification;
h) Results from prior improper payment work; and
i) Other Risk Susceptible Programs, i.e. those programs determined by OMB on a case by case basis to be susceptible to high risk of improper payment.

[1] There were 121 distinct Programs identified. Of these, there was a reduction of 28 Programs due to combining 20 Institution and Management and 9 Education and 2 Commercial Crew and Cargo into 3 separate groupings of 1 each. This reduced the total number of Programs from 121 down to 93. These Programs were selected for consolidation based on analysis of the budget: the Institutions and Management Programs have unique funding; individual Education Programs are historically too insignificant to meet the threshold for review; and Commercial Crew and Cargo are combined under the aegis of Commercial Spaceflight.

NASA also reviewed pertinent improper payment related documents and reports, including the NASA OIG Report *NASA's Compliance with the Improper Payments Information Act for Fiscal Year 2013* (Report No. IG-14-016), the Agency's FY 2013 OMB A-123, Appendix A, *Internal Control over Financial Reporting* Summary Report and NASA's Executive Budget documents[2]. Once this review and analysis was complete, the FY 2014 Risk Assessment was updated to reflect whether or not any NASA Programs were found to be susceptible to significant improper payments.

No programs were identified as susceptible to significant improper payments for FY 2014 based on risk ratings determined during the risk assessment process.

Conclusion

The results of the FY 2014 risk assessment process, along with NASA's history of positive improper payment testing results, concluded that none of NASA's Programs were susceptible to a high risk of significant improper payments. However, NASA will continue to monitor payments and take appropriate corrective actions for any identified improper payments. NASA attributes much of the positive results to the centralized procurement and payment activities conducted at the NASA Shared Services Center (NSSC). Centralized processing provides a sound internal control environment that mitigates the risk of improper payments across the Agency.

[2] National Aeronautics and Space Administration FY 2013, FY 2012, FY 2011 and FY 2010 *Budget Estimates*

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Recapture Audit

On July 22, 2010 the President signed into Law the Improper Payment Elimination and Recovery Act (IPERA; Pub. L. No. 111-204). IPERA requires all federal agencies to conduct payment recapture audits as part of its overall program to ensure effective internal controls over payments. NASA continues to perform recapture audits as part of its overall program to ensure effective internal control over payments.

This approach is in accordance with the amended Office of Management and Budget (OMB) Circular A-123, Appendix C guidance, which allows agencies to make the determination to exclude classes of contract payments from recapture audit activities if the agency determines that recapture audits are inappropriate or not a cost-effective method for identifying and recovering improper payments. NASA employs the Defense Contract Audit Agency (DCAA) to perform auditing procedures on cost-type contracts. Performing a separate recapture audit on these cost-type contracts would be duplicative and not cost-effective. Consequently, NASA does not consider it cost-effective to conduct payment recapture audits for cost type contracts and does not include cost-type contracts in its recapture audit.

In FY 2014 NASA awarded the contingency based Recapture Audit contract to an industry leading consultant. The Recapture Audit began the review of FY 2013 contract disbursement transactions and accounts to identify and recover overpayments, duplicate payments, erroneous payments, lost credit memos, and internal transaction errors of NASA's fixed price contracts.

Due to FY 2014 Recapture Audit being newly awarded, some delays occurred which resulted in the Recapture Auditor being unable to complete the review. As a result, in FY 2015, NASA will expand its Recapture Audit to be inclusive of both FY 2013 and FY 2014 disbursements.

NASA's recovery audit scope for FY 2013 disbursements is shown in the table below as of September 30, 2014:

NASA Center	Contract Designation	Contract Item Count	Number of Paid Invoices	Amount of Paid Invoices
10 - Headquarters	Fixed Price	704	4,539	$337,221,108
21 - Ames Research Center	Fixed Price	471	2,350	$163,500,203
22 - Glenn Research Center	Fixed Price	1,414	3,705	$142,638,162
23 - Langley Research Center	Fixed Price	981	3,350	$117,069,510
24 - Dryden Flight Research Center	Fixed Price	358	1,348	$66,381,162
51 - Goddard Space Flight Center	Fixed Price	1,474	6,274	$371,023,445
62 - Marshall Space Flight Center	Fixed Price	742	2,388	$297,116,549
64 - Stennis Space Center	Fixed Price	90	730	$41,451,125
72 - Johnson Space Center	Fixed Price	618	2,876	$1,286,009,347
76 - Kennedy Space Center	Fixed Price	598	2,496	$1,151,026,604
		7,450	**30,056**	**$3,973,437,215**

In addition to the Recapture Audit activities listed above, NASA Centers and Office of the Inspector General (OIG) may engage in other recapture activities of additional overpayments. Examples of such activities include Agency post-payment review/audits, single audit and self-reported overpayments. NASA Centers provided information totaling $379,903 and OIG provided information totaling $44,567.

Payment Recapture Audit Reporting

Type of Payment	Amount Subject to Review for Reporting FY 2013	Actual Amount Reviewed and Reported FY 2013	Amount Identified for Recovery FY 2013	Amount Recovered FY 2013	% of Amount Recovered out of Amount Identified FY 2013	Amount Outstanding FY 2013	% of Amount Outstanding out of Amount Identified FY 2013	Amount Determined Not to be Collectable FY 2013	% of Amount Determined Not to be Collectable out of Amount Identified FY 2013	Amounts Identified for Recovery (2012 + PYs)	Amounts Recovered (2012 + PYs)	Cumulative Amounts Identified for Recovery (2013 + PYs)	Cumulative Amounts Recovered (2013 + PYs)	Cumulative Amounts Outstanding (2013 + PYs)	Cumulative Amounts Determined Not to be Collectable (2013 + PYs)
Fixed Price Contract	$3,973,437,215	$3,973,437,215	$0	$0	0%	$0	0%	$0	0%	$285,497	$261,432	$285,497**	$261,432**	$24,065**	$23,147*

**Total cumulative amounts began with FY 2004.

*NASA has determined four (4) claims totaling $23,147 to be uncollectible because they were delinquent more than 180 days. These items were transferred to Treasury in accordance with Treasury Financial Manual (TFM 4035.40).

Payment Recapture Audit Targets

Type of Payment	CY Amount Identified	CY Amount Recovered	CY Recovery Rate (Amount Recovered/ Amount Identified)	CY + 1 Recovery Rate Target	CY + 2 Recovery Rate Target	CY + 3 Recovery Rate Target
Fixed Price Contracts	$0	$0	N/A	98%*	98%*	98%*

*Recovery Rate Target is based on the cumulative amounts recovered/cumulative amounts identified, but the target will not be less than 90%.

Aging of Outstanding Overpayments

Type of Payment	CY Amount Outstanding (0-6 months)	CY Amount Outstanding (6 months to 1 year)	CY Amount Outstanding (over 1 year)
Fixed Price Contracts	$0	$0	$0

Disposition of Recaptured Funds

Type of Payment	Agency Expenses to Administer the Program	Payment Recapture Auditor Fees	Financial Management Improvement Activities	Original Purpose	Office of Inspector General	Returned to Treasury
Fixed Price Contracts	$0*	$9,656	$0	$39,066	$0	$285

*NASA believes administrative costs to be marginal and currently has not accumulated a cost figure.

Overpayments Recaptured Outside of Payment Recapture Audits

Source of Recovery	Amount Identified (CY)	Amount Recovered (CY)	Amount Identified (PY)	Amount Recovered (PY)	Cumulative Amount Identified (CY+PYs)	Cumulative Amount Recovered (CY+PYs)
OIG Reviews	$0	$44,567*	$44,567	$0	$44,567	$44,567
Self-Reported Overpayments	$379,903	$379,903	$0	$0	$379,903	$379,903

*The OIG amount identified in FY 2012 was $44,567. The amount recovered in FY 2013 was $34,169 and the remaining amount of $10,398 was offset as an underpayment. Therefore, the amounts net to $44,567.

NASA has taken steps through Improper Payment reviews and recapture audits to continue holding Agency managers accountable for reducing and recovering improper payments. The recapture audit process is monitored by the Office of the Chief Financial Officer to ensure compliance with NASA's Recapture Audit Guidance. In addition, all collection and disbursement functions are centralized which ensures consistent application of the control environment and reduction of improper payments risk. NASA has the infrastructure and information technology in place to reduce improper payments. There are no statutory or regulatory barriers limiting NASA's ability to reduce improper payments.

Do Not Pay Initiative

The Office of Management and Budget (OMB) issued Memorandum M-12-11 dated April 12, 2012, *Reducing Improper Payments through the "Do Not Pay List"* requiring agencies to submit a "Do Not Pay (DNP) List" Implementation Plan (OMB) by August 31, 2012.

NASA completed its plan and outlined the timeline for enrollment into the Do Not Pay (DNP) solution for pre-payment eligibility reviews. In May 2012, NASA signed up for the DNP Mailing List to receive updates on new functionalities and updates for new data sources that were added to the Treasury's DNP portal. In June 2012, NASA provided its draft plan to OMB for review. On December 17, 2012, NASA provided its Final DNP Plan to OMB.

NASA fully integrated the Treasury's DNP portal process on September 27, 2014. The DNP portal will be used by NASA to review potential improper payments and will utilize the following data sources within the DNP portal: the Social Security Administration Death Master File (SSA-DMF) and the System for Award Management Exclusion Record-Private (SAM-EPLS).

Presently, NASA conducts a review of potential improper payments on a monthly basis outside Treasury's DNP portal process by sending its payment file to Treasury via the Payment Application Modernization (PAM). PAM is a Treasury based system which agencies are required to use when submitting bulk payment files to Treasury by October 1, 2014. The post-payment data is then extracted through Treasury's on-line Payments, Claims and Enhanced Reconciliation (PACER) Report and matched against the SSA-DMF and SAM-EPLS data sources. At the present time, it is not known if Treasury's PAM and PACER systems will be incorporated into the DNP system.

NASA's adjudication process operates with DNP providing an e-mail notification of matches which are reviewed by NASA and reported back to Treasury. The cumulative results of these monthly reviews reported in Table 7 were for the period of October 2013 through July 2014. During this time period, there were 83,030 potential improper payments initially identified by Treasury with a dollar value of $10.501 billion. This initial volume was a result of Treasury's sort criteria which compiled the data using the vendor name in SAM. NASA further refined that initial sort, validating the data using the Tax Identification Number (TIN), full name or address which resulted in the list being reduced to 71 potential improper payments with a dollar amount of $1.760 million. NASA then verified these were false positives and reported the potential improper payments back to Treasury. The term false positive indicates that the identified items were in fact not improper payments.

One item of note is that the current adjudication process has a three month lag time with the collection of the data. NASA's integration into the DNP portal process will eliminate this three month lag time in reporting of the disposition of potential improper payments.

Table 7: Implementation of the Do Not Pay Initiative to Prevent Improper Payments

	Number (#) of payments reviewed for improper payments *Note 1*	Dollars ($) of payments reviewed for improper payments *Note 1*	Number (#) of payments stopped	Dollars ($) of payments stopped	Number (#) of improper payments reviewed and not stopped	Dollars ($)of improper payments reviewed and not stopped
Reviews with the DMF only *Note 2*	0	0	0	0	0	0
Full Number and Amount of Payments Sent through PAM and PACER *Note 1*	83,030	10,501,000,000	0	0	0	0
Reviews with all other databases *Note 3*	71	1,759,555	0	0	0	0

Note 1: Data reported is from **October 2013 - July 2014**. Potential Improper Payment data received has an approximate lag time of 3 months. There were a total of 83,030 potential improper payments initally identified by Treasury with a dollar value of $10.5B. This initial volume is a result of Treasury's sort criteria which compiles the data using the vender name in the System for Award Management (SAM). NASA further refined that initial sort, validating the data using the Tax Identification Number (TIN), full name and address which resulted in the list being reduced to 71 potential improper payments with a dollar amount $1.760M. NASA then verified these were false positives and reported the information back to Treasury. The term false positives indicates that they were in fact not improper payments.

Note 2: Data derived from the Social Security Administration-Death Master File (SSA-DMF)

Note 3: Data derived from the System for Award Management-Excluded Party List System (SAM-EPLS)

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Schedule of Spending

The Schedule of Spending (SOS) presents an overview of how and where agencies are spending (obligating) money for the reporting period. The data used to populate the Schedule of Spending is the same underlying data that is used to populate the Statement of Budgetary Resources (SBR). The SOS table presents budgetary data in general terms, but corresponds to amounts shown on the SBR. See table below:

Schedule of Spending Line Item Title		Statement of Budgetary Resources Line Item Title
Total Resources	→	Total Budgetary Resources
Total Amounts Agreed to be Spent	→	Obligations Incurred
Total Spending	→	Gross Outlays

USASpending.gov is a Federal Web site designed in accordance with the Federal Funding Accountability and Transparency Act of 2006. The information for this website is gathered from the Federal Procurement Data System (FPDS) which contains information about Federal Contracts, and the Federal Assistance Awards Data System (FAADS) which contains information about Federal financial assistance such as grants, loans, insurance and direct subsidies. Information from these two systems is also captured by the Agency's Financial System through PRISM, which is an acquisition management system used by agencies Government wide. The Agency's financial system is used to generate the SBR. NASA conducts a quarterly validation of procurement information reported on USASpending.gov.

(In Millions of Dollars)	2014	2013
Section I: What Money is Available to Spend?		
Total Resources	$ 21,504	$ 20,755
Less Amount Available but Not Agreed to be Spent	1,018	903
Less Amount Not Available to be Spent	133	141
Total Amounts Agreed to be Spent	**$ 20,353**	**$ 19,711**
Section II: How was the Money Spent?		
Space Operations Mission		
Personnel compensation and benefits	$ 325	$ 342
Contractual services and supplies	3,472	3,408
Acquisition of assets	18	18
Grants and fixed charges	21	19
Other	2	1
Total Spending	3,838	3,788
Science Mission		
Personnel compensation and benefits	$ 306	$ 306
Contractual services and supplies	3,700	3,489
Acquisition of assets	46	54
Grants and fixed charges	556	564
Other	3	—
Total Spending	4,611	4,413

(In Millions of Dollars)	2014	2013
Section II: How was the Money Spent? (ctd.)		
Exploration Mission		
Personnel compensation and benefits	$ 450	$ 435
Contractual services and supplies	3,219	3,499
Acquisition of assets	61	25
Grants and fixed charges	65	69
Other	1	—
Total Spending	3,796	4,028
Aeronautics Mission		
Personnel compensation and benefits	$ 188	$ 191
Contractual services and supplies	263	276
Acquisition of assets	22	24
Grants and fixed charges	30	31
Other	—	1
Total Spending	503	523
Cross-Agency Mission		
Personnel compensation and benefits	$ 1,224	$ 1,192
Contractual services and supplies	3,403	3,719
Acquisition of assets	65	87
Grants and fixed charges	29	37
Other	35	36
Total Spending	4,756	5,071
Education Mission		
Personnel compensation and benefits	$ 7	$ 7
Contractual services and supplies	22	20
Grants and fixed charges	84	109
Total Spending	113	136
Office of Inspector General		
Personnel compensation and benefits	$ 31	$ 30
Contractual services and supplies	6	6
Acquisition of assets	1	1
Total Spending	38	37
Space Technology Mission		
Personnel compensation and benefits	$ 124	$ 124
Contractual services and supplies	399	385
Acquisition of assets	7	5
Grants and fixed charges	30	20
Total Spending	560	534
Construction and Environmental Compliance and Restoration		
Personnel compensation and benefits	$ —	$ 166
Contractual services and supplies	192	207
Acquisition of assets	298	—
Total Spending	490	373
Other		
Personnel compensation and benefits	$ 18	$ 18
Contractual services and supplies	925	939
Acquisition of assets	11	14
Grants and fixed charges	2	2
Other	—	(3)
Total Spending	956	970
Total Spending	**$ 19,661**	**$ 19,873**
Section III: Who did the Money go to?		
Federal	$ 1,319	$ 1,359
Non-Federal	19,034	18,352
Total Amounts Agreed to be Spent	**$ 20,353**	**$ 19,711**

Freeze the Footprint

The National Aeronautics and Space Administration (NASA) is committed to the goal of maintaining or reducing the total square footage of its domestic office and warehouse inventory compared to its FY 2012 baseline as to reduce the costs associated with real property in accordance with Section 3 of the Office of Management and Budget (OMB) Memorandum 12-12, *Promoting Efficient Spending to Support Agency Operations* and OMB Management Procedures Memorandum 2013-02, the "Freeze the Footprint" policy implementation guidance. NASA continues to evaluate its real property requirements to identify facilities that are no longer needed. Office and laboratory spaces are consolidated, where possible, into buildings that utilize space and energy more efficiently. Duplicative assets will be consolidated, where possible, and under-utilized assets will be considered for consolidation, co-location purposes or disposal.

NASA has an active demolition program. Since 2004, NASA has disposed of more than 1.4 million square feet of space. This demolition program has been an important tool in eliminating nonessential facilities. New buildings are constructed to utilize space and operate more efficiently. NASA has reduced maintenance and utility costs by consolidating functions in these new, smaller facilities. Studies conducted by NASA on its new consolidated facilities validate measurable savings in utility costs over the buildings that they have replaced.

NASA will continue identifying, implementing, and executing facility efficiency and effectiveness through management, development, and operational strategies that reduce life cycle cost and risk while ensuring safety and mission success.

Freeze the Footprint Baseline Comparison	FY 2012 Baseline	FY 2013	Change (FY 2012 Baseline - FY 2013)
Square Footage *(SF in Millions)*	15.714	15.449*	(0.265)

*The above represents the correct FY 2013 square footage and is revised from the number posted on http://www.performance.gov/.

Reporting of O&M Costs – Owned and Directly Leased Buildings	FY 2012 Baseline	FY 2013	Change (FY 2012 Baseline - FY 2013)
Operation and Maintenance Costs *($ in Millions)*	$ 92	$ 62	$ (30)

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Summary of Financial Statement Audit and Management Assurances

The following tables summarize the Agency's FY 2014 Financial Statement Audit and Management Assurances. Table 1 summarizes the status of prior year — FY 2013 material weaknesses identified, if any by the Financial Statement Auditor. Table 2 summarizes the status of prior year material weaknesses, if any identified by NASA Management.

Table 1: Summary of Financial Statement Audit

Audit Opinion	Unmodified				
Restatement	No				
Material Weaknesses	Beginning Balance	New	Resolved	Consolidated	Ending Balance
None	0	0	0	0	0
Total Material Weaknesses	0	0	0	0	0

Table 2: Summary of Management Assurances

Effectiveness of Internal Control over Financial Reporting (FMFIA 2)						
Statement of Assurance	Unqualified					
Material Weaknesses	Beginning Balance	New	Resolved	Consolidated	Reassessed	Ending Balance
None	0	0	0	0	0	0
Total Material Weaknesses	0	0	0	0	0	0

Effectiveness of Internal Control over Operations (FMFIA 2)						
Statement of Assurance	Unqualified					
Material Weaknesses	Beginning Balance	New	Resolved	Consolidated	Reassessed	Ending Balance
None	0	0	0	0	0	0
Total Material Weaknesses	0	0	0	0	0	0

Conformance with Financial Management System Requirements (FMFIA 4)						
Statement of Assurance	Systems conform					
Non-Conformances	Beginning Balance	New	Resolved	Consolidated	Reassessed	Ending Balance
None	0	0	0	0	0	0
Total Non-Conformances	0	0	0	0	0	0

Compliance with Federal Financial Management Improvement Act (FFMIA)		
	Agency	Auditor
1. System Requirements	No lack of substantial compliance noted	No lack of substantial compliance noted
2. Accounting Standards	No lack of substantial compliance noted	No lack of substantial compliance noted
3. USSGL at Transaction Level	No lack of substantial compliance noted	No lack of substantial compliance noted

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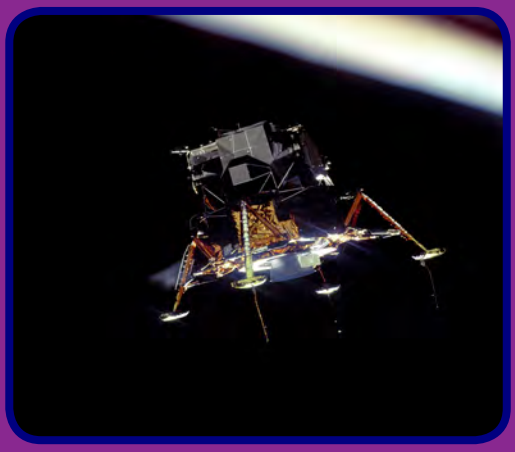
On Dec. 6, 1998, the crew of space shuttle mission STS-88 began construction of the International Space Station, attaching the U.S.-built Unity node and the Russian-built Zarya module together in orbit. The crew carried a large-format IMAX® camera, used to take this image of Unity lifted out of Endeavour's payload bay to position it upright for connection to Zarya (online December 6, 2013). (Credit: NASA)



The Apollo 11 Lunar Module Eagle, in a landing configuration was photographed in lunar orbit. (Credit: NASA)

The Orbital Sciences Corporation Antares rocket, with the Cygnus spacecraft onboard, is rolled out of the Horizontal Integration Facility. (Credit: NASA)

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