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Statement of
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National Aeronautics and Space Administration

before the

Committee on Oversight and Government Reform
U.S. House of Representatives

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear today to discuss NASA's efforts to improve acquisition management in response to the Government Accountability Office's (GAO's) 2015 High Risk List. By the very nature of our mission and the work we do, NASA's activities are inherently "high risk" endeavors, as we are constantly looking to expand the frontiers of human knowledge. There is no other agency in the Nation, let alone the world, undertaking as ambitious a program of exploration and technology development as NASA. As we develop the unique missions and capabilities to explore space, and advance understanding of Earth and develop technologies to improve the quality of life on our home planet, we also recognize the need to be responsible stewards of taxpayers' dollars. This means delivering missions on cost and on schedule and identifying risks as quickly as possible so we can implement appropriate corrective action.

When NASA was first added to the GAO's High Risk List in 1990, our project management and oversight practices did not have the same level of rigor as they do today, leading to cost overruns and schedule delays. Since then, we have made significant improvements to how we manage projects and prepare people to manage, leading to a dramatic reduction in the number of projects that exceed their baselines. Several projects have recently launched within their baselines, including Juno, Landsat Data Continuity Mission (LDCM)/Landsat 8, Mars Atmosphere and Volatile EvolutioN (MAVEN), and just two weeks ago, Soil Moisture Active Passive (SMAP). Moreover, other projects still in development are on track to be completed within their baselines, such as Origins-Spectral Interpretation-Resource Identification-Security-Regolith Explorer (OSIRIS-REx). Even the James Webb Space Telescope (JWST), which was originally confirmed under an old cost policy and exceeded its original baseline, has benefited from these changes and has remained on track to meet its new cost and schedule baseline, which was set in accordance with the new policy. In the instances

where a project confirmed in accordance with the new policy does experience issues, the percentage of growth relative to the total project cost has greatly diminished as well. This is a trend that the GAO has observed over the past several years in their annual "Assessments of Selected Large-Scale Projects."

The 2015 High Risk Report includes a scorecard detailing which of the GAO's five criteria for removal from the High Risk List have been met, partially met, or are unmet for each High Risk area. I am pleased to report that NASA has fully met the leadership commitment, action plan, and monitoring criteria. The remaining two criteria, capacity and demonstrated progress, have been partially met and we are actively working to implement additional changes across the Agency to address them.

Corrective Action Plan

NASA has been working to implement seven initiatives to improve acquisition management through a High Risk Corrective Action Plan developed in 2007. Those initiatives are: (1) Program/Project Requirements and Implementation Practices; (2) Agency Strategic Acquisition Approach; (3) Contractor Cost Performance Monitoring; (4) Project Management Training and Development; (5) Improve Life-Cycle Cost/Schedule Management Processes; (6) Integrated Enterprise Management Program (IEMP) Process Improvement; and, (7) Procurement Processes and Policies. Six of these seven initiatives are operational, as NASA has put in place new requirements, policies, procedures, training, and other tools to improve how we manage our major acquisitions and ensure our workforce has the necessary associated tools. Even though these initiatives are operational, we continually look for new ways to refine how we do business and share best practices and lessons learned within the project management community.

In 2014, NASA declared that the one outstanding initiative, Contractor Cost Performance Monitoring, was closed. This initiative was originally designed to improve the availability of contractor data to support performance monitoring of programs and projects. The initiative would be accomplished through the use of enhanced business systems and changes to the contractor cost reporting process. NASA performed analyses at that time to identify gaps in the existing key business systems and concepts and courses of action that could be implemented to address those gaps. As a result of this analysis, NASA and GAO agreed to replace the original objective, and instead instituted several process improvements designed to achieve greater insight into project performance, including contractor cost performance. Among these improvements is expanding the number of projects subject to earned value management (EVM) requirements by lowering the lifecycle cost threshold.

As part of the Corrective Action Plan, in 2008, NASA established a set of metrics to assess performance on a semi-annual basis. These metrics consider performance against the established cost and schedule baselines and annual performance indicators, as well as whether new projects are being implemented in accordance with NASA policy. As of the

most recent performance report provided to the GAO, based on NASA's performance as of the fourth quarter of 2014, NASA is fully on track to meet all of these metrics.

We are in the process of reassessing these metrics to ensure that they continue to be fully aligned with NASA requirements and will work with the GAO as necessary to update how they are calculated. For example, to coincide with the release of the 2014 NASA Strategic Plan, we updated the suite of Annual Performance Indicators (APIs) evaluated as a measure of whether NASA's major projects were on track to meet their level 1 requirements. This list of assessed APIs was expanded to include all major projects in the portfolio. We will undertake a similar review following the release of subsequent strategic plans.

2015 High Risk List Response

GAO has identified five criteria that must be met before a focus area can be removed from the High Risk List: (1) a demonstrated strong commitment to, and top leadership support for, addressing problems; (2) the capacity to address problems; (3) a corrective action plan; (4) a program to monitor corrective measures; and, (5) demonstrated progress in implementing corrective measures.

NASA has fully met the leadership commitment, action plan, and monitoring criteria, and has partially met the criteria for capacity and demonstrated progress. In order to meet the remaining criteria, the GAO would like NASA to address gaps in the guidance for the joint cost and schedule confidence level (JCL) policy and EVM, as well as demonstrate continuing success in keeping projects within their cost and schedule baselines established at confirmation. These are all areas where NASA is devoting significant resources to improve our capabilities, leading to better management of our projects.

NASA cost policies have evolved over time towards a probabilistic JCL analysis that enables decisions to be made on desired confidence levels (the probability of completing a project within a certain lifecycle cost and schedule) based on an individual project's unique technical and programmatic characteristics. A key benefit of the JCL policy is the added rigor it brings to the analysis process, driving an integrated analysis of cost, schedule, and risk. From the project manager's perspective, the JCL helps them to better understand and manage their risks. From a decision maker's perspective, the JCL helps them understand the risks inherent in a project so they are able to make fully informed decisions as to what level of risk is acceptable to the Agency.

NASA first established its JCL policy in 2009 by requiring a JCL of major projects coming to confirmation. This requirement was subsequently expanded to include cost and schedule ranges for projects going through Key Decision Points during the Formulation Phase. Since the JCL policy was put into place, programmatic performance has improved as NASA has launched more projects at or nearer their original cost and schedule baselines than under previous policies. NASA acknowledges there is still room for improvement with the JCL implementation, as evidenced by two recent examples of

projects breaching their baselines shortly after confirmation. However, many more projects have been able to keep to their commitments.

NASA's approach to conducting JCLs has evolved as we have gained more experience with them, and there are several improvements in work to further enhance our capabilities. For example, NASA expects to release an updated version of our Cost Estimating Handbook later this month, which will provide additional guidance on how to conduct JCLs. JCLs can be very complex, so NASA is developing new tools to better communicate risk, such as graphical and tabular reports, as well as new techniques and tools to enable more accurate assessments of complex JCL models. In addition, NASA is proactively identifying areas of improvement and developing solutions to strengthen the community of practice through education, training, data sharing and communication.

As with improvements to JCLs, NASA is taking a similar approach to enhancing the Agency's EVM capabilities. EVM guidance is provided to the NASA community through the recently released Project Management Handbook, as well as through the EVM Handbook. This past year, we also developed an Integrated Program Management Report Instructions Guide to provide a methodology for evaluating cost and schedule data. We are planning to issue a draft NASA Project Planning and Control (PP&C) handbook, which would establish PP&C standards across the Agency, later this year for review.

Since 2013, NASA has been rolling out an in-house EVM capability at the major spaceflight centers. To date, this capability has been implemented on Space Launch System (SLS; Marshall Space Flight Center), Ice, Cloud, and Land Elevation Satellite-2 (ICESat-2; Goddard Space Flight Center), and Ground Systems Development Office (GSDO; Kennedy Space Center). In 2015, the capability will be implemented on Orion (Johnson Space Center). We are also working with several of our contractors to validate their EVM systems, including the Applied Physics Lab and the Southwest Research Institute, as well as engaging with universities and other research organizations that may lead NASA projects but do not otherwise have institutional requirements for fully-developed EVM systems.

Another area of focus has been developing and issuing guidance for smaller projects. This past September, NASA formalized the EVM requirements for space flight projects with lifecycle costs under $150 million. These requirements provide clear guidelines and expectations for how EVM will be implemented, including opportunities for tailoring their EVM in such a way as to reduce unnecessary burden given the limited resources provided to these projects. To aid in this effort, NASA is currently developing an EVM scalability solution that will benefit smaller missions.

NASA has many forums where this data is routinely reviewed to ensure that projects remain on track or that issues are identified and resolved in a timely manner. This includes formal, regularly recurring reviews at the project, Center, Mission Directorate, and Agency level, as well as ad hoc meetings should issues arise. We also are improving

our communities of practice to share best practices and lessons learned across organizations so projects can learn from each other.

The Path Forward

As NASA seeks to undertake a bold new era of discovery, we are also developing one-of-a-kind technologies and capabilities. We therefore rely on the iterative knowledge we gain with each new project in order to improve our project management practices and introduce new tools to assess whether our projects are on track to meet their cost and schedule commitments. We appreciate the open dialog we have had over the past several years with the GAO as we have refined our project management requirements and discussed best practices that might apply to our projects at different stages in their lifecycles. As the GAO has acknowledged, these improvements are already yielding the desired results with our small and medium-class missions. Our larger, more complex projects typically involve the development of a significant number of new technologies, which present greater risk and are more difficult to assess at the outset. As a result, while there is still work to be done, I am confident we are on the right track and we will continue to manage projects without the significant cost growth and schedule delays that originally put us on the High Risk List.

Robert M. Lightfoot, Jr., Associate Administrator

Robert M. Lightfoot Jr. became Associate Administrator for NASA, the agency's highest-ranking civil servant position, effective Sept. 25, 2012.

He previously was director of NASA's Marshall Space Flight Center in Huntsville, Ala. Named to the position in August 2009, he headed one of NASA's largest field installations, which plays a critical role in NASA's space operations, exploration and science missions. Lightfoot managed a broad range of propulsion, scientific and space transportation activities contributing to the nation's space program. He served as acting director of the center from March 2009 until his appointment as director.

From 2007 to 2009, Lightfoot was deputy director of the Marshall Center. Lightfoot served as manager of the Space Shuttle Propulsion Office at Marshall from 2005 to 2007, where he was responsible for overseeing the manufacture, assembly and operation of the primary shuttle propulsion elements: the main engines, external tank, solid rocket boosters and reusable solid rocket motors.

From 2003 to 2005, he served as assistant associate administrator for the Space Shuttle Program in the Office of Space Operations at NASA Headquarters in Washington. His responsibilities included space shuttle return to flight activities following the Columbia tragedy, technical and budgetary oversight of the $3 billion annual budget and initial transition and retirement efforts for shuttle infrastructure.

In 2002, Lightfoot was named director of the Propulsion Test Directorate at NASA's Stennis Space Center. He served as deputy director of the organization beginning in 2001, until his appointment as director.

Lightfoot began his NASA career at the Marshall Center in 1989 as a test engineer and program manager for the space shuttle main engine technology test bed program and the Russian RD-180 engine testing program for the Atlas launch vehicle program.

Lightfoot received a bachelor's degree in mechanical engineering in 1986 from the University of Alabama. In October 2007, he was named Distinguished Departmental Fellow for the University of Alabama, Department of Mechanical Engineering. He was selected as a University of Alabama College of Engineering fellow in 2009. Lightfoot serves on the University of Alabama Mechanical Engineering Advisory Board. In 2010, he was inducted into the State of Alabama Engineering Hall of Fame.

Lightfoot has received numerous awards during his NASA career, including a NASA Outstanding Leadership medal in 2007 for exemplary leadership of the Shuttle Propulsion Office, assuring safety for the return to flight of the space shuttle. In 2006, he was awarded the Presidential Rank Award for Meritorious Executives, and in 2010 he received the Presidential Rank Award for Distinguished Executives -- the highest honors attainable for federal government work. In 2000, Mr. Lightfoot received a Spaceflight Leadership Recognition Award, which recognizes leaders who exemplify characteristics necessary for success. In 1999, NASA's astronaut corps presented him with a Silver Snoopy Award, which honors individuals who have made key contributions to the success of human spaceflight missions. He also received the NASA Exceptional Achievement Medal in 1996 for significant contributions to NASA's mission.