

**AUDIT  
REPORT**

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**VALIDATION AND VERIFICATION OF  
SELECTED NASA FY 2000 PERFORMANCE  
DATA RELATED TO THE GOVERNMENT  
PERFORMANCE AND RESULTS ACT (GPRA)**

**March 30, 2001**

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National Aeronautics and  
Space Administration

**OFFICE OF INSPECTOR  
GENERAL**

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## **Acronyms**

CFO	Chief Financial Officer
EOCAP	Earth Observing Commercialization Applications Program
FY	Fiscal Year
GAO	General Accounting Office
GPRA	Government Performance and Results Act
HEDS	Human Exploration and Development of Space
OIG	Office of Inspector General
OMB	Office of Management and Budget

W

March 30, 2001

TO: A/Administrator

FROM: W/Inspector General

SUBJECT: INFORMATION: Validation and Verification of Selected NASA FY 2000 Performance Data Related to the Government Performance and Results Act (GPRA)<sup>1</sup>  
Report Number IG-01-020

The NASA Office of Inspector General (OIG) has completed an audit of the accuracy and reliability of performance data for selected GPRA performance targets<sup>2</sup> that will be in the Agency's Fiscal Year (FY) 2000 Performance Report.<sup>3</sup> The audit is a continuation of our oversight of NASA's implementation of GPRA as described in our Results Act Review Plan.<sup>4,5</sup> The annual Performance Report is a document that the Congress and Office of Management and Budget (OMB) will use to assess NASA's overall performance and may make decisions on Agency programs and funding levels. NASA's FY 2000 Performance Report will contain the Agency's assessment of its actual performance against 211 performance targets. The supporting data and information on 19 of 23 performance targets we reviewed<sup>6</sup> were adequate, and we did not identify any significant problems with reported actual performance for those targets.

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<sup>1</sup> Congress enacted GPRA in 1993 to improve public confidence in the Federal Government by holding agencies accountable through setting program goals, measuring performance against those goals, and reporting publicly on progress. This act is contained in Public Law 103-62.

<sup>2</sup> Performance target is the term NASA uses in the Performance Plan for those measures or metrics that were established to accomplish (and measure) the individual goals and objectives. Target, as used in this report, generally equates to the terms "measure" or "indicator" as used in the GPRA.

<sup>3</sup> In March 2000, NASA published its first Performance Report covering FY 1999. At the time we performed the audit, NASA was collecting data for its Performance Report covering FY 2000.

<sup>4</sup> An October 1998 letter signed by the House Majority Leader and Chairmen of the House Committee on Government Reform and Oversight; the House Subcommittee on Government Management, Information, and Technology; and the Results Caucus asked the NASA OIG to establish a GPRA review plan to assess Agency controls. In response to the request, the OIG included a plan in its Semiannual Report for March 31, 1999.

<sup>5</sup> The NASA OIG has issued reports on previous audits of NASA's implementation of GPRA. Additional details on the audits are in Appendix B.

<sup>6</sup> We reviewed 23 targets that related to 6 critical areas: Procurement, Financial Management, Information Technology, International Space Station, Program and Project Management, and Safety and Mission Assurance.

However, the performance reported on four targets was not fully reliable because the supporting data did not accurately support the results described.<sup>7</sup> Reported performance for some of the 188 targets not reviewed may also not be fully reliable for the same reasons. Reporting performance results that are not fully reliable limits the usefulness of the Performance Report to NASA, OMB, and the Congress. Although NASA had taken steps to validate performance information that will go into the annual Performance Report, NASA could further improve the process.

## **Background**

Because NASA Centers implement many of the programs and activities that have GPRA performance goals and targets, they were the source for much of the data used to measure and evaluate actual performance. For most of the targets we reviewed, the Headquarters offices responsible for the program or activity had collected the data from the Centers, developed a written assessment of the actual performance, and submitted that assessment to the Chief Financial Officer (CFO) for use in preparing the Performance Report. We evaluated those assessments and the supporting information during the audit.

## **Management's Response and OIG Evaluation**

NASA concurred with our recommendations. Management reviewed the performance statements for the four performance targets and made the necessary corrections or clarifications in the FY 2000 Performance Report. In addition, for each performance target, NASA included a description of the methods used to verify and validate supporting data and identified the data source. These actions help to substantiate reported actual performance and improve the usefulness of the Performance Report. In addition, the CFO emphasized the need to develop clear and measurable performance targets in the FY 2002 Performance Plan data call letter and the FY 2003 performance metric development guidance. The guidance on the FY 2003 performance metrics also summarized the characteristics of good performance metrics. NASA will continue to emphasize the need to disclose data limitations in future performance reporting.

Details on the status of the recommendations are in the finding section of the report.

**[original signed by]**

Roberta L. Gross

Enclosure

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<sup>7</sup> For purposes of our audit and this report, the terms “reported performance” and “reported results” are the same and refer to written self-assessments of actual results prepared by the responsible GPRA officials and provided to the NASA Chief Financial Officer for the Performance Report.

Final Report on Audit of Validation and Verification of Selected NASA FY 2000 Performance  
Data Related to the Government Performance and Results Act (GPRA)

**FINAL REPORT**  
**AUDIT OF VALIDATION AND VERIFICATION OF SELECTED**  
**NASA FY 2000 PERFORMANCE DATA RELATED TO THE**  
**GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA)**

W

March 30, 2001

TO: B/Acting Chief Financial Officer

FROM: W/Assistant Inspector General for Auditing

SUBJECT: Final Report on Audit of Validation and Verification of Selected NASA FY  
2000 Performance Data Related to the Government Performance and Results  
Act (GPRA)  
Assignment Number A0100500  
Final Report IG-01-020

The subject final report is provided for your information and use. Please refer to the Executive Summary for the overall audit results. Our evaluation of your response is incorporated into the body of the report. The corrective actions completed for the recommendations were responsive. Management's actions are sufficient to close the recommendations for reporting purposes.

If you have questions concerning the report, please contact Mr. Chester A. Sipsock, Program Director, Environmental and Financial Management Audits, at (216) 433-8960, or Ms. Carol A. St. Armand, Audit Program Manager, at (301) 286-7269. We appreciate the courtesies extended to the audit staff. The report distribution is in Appendix E.

**[original signed by]**

Russell A. Rau

Enclosure

cc:

AE/Chief Engineer

AS/Chief Scientist

BF/Director, Financial Management Division

BR/Acting Director, Resources Analysis Division

JM/Director, Management Assessment Division

M/Associate Administrator for Space Flight

R/Associate Administrator for Aerospace Technology

S/Associate Administrator for Space Science

U/Acting Associate Administrator for Biological and Physical Research

Y/Associate Administrator for Earth Science

Z/Acting Associate Administrator for Policy and Plans

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# NASA Office of Inspector General

IG-01-020  
A0100500

March 30, 2001

## Validation and Verification of Selected NASA FY 2000 Performance Data Related to the Government Performance and Results Act (GPRA)

### Executive Summary

**Background.** The NASA OIG has completed an audit of the accuracy and reliability of performance data for selected GPRA performance targets that will be in the Agency's FY 2000 Performance Report. The Performance Report is an important document that NASA, the Congress, and the OMB will use to assess the Agency's overall performance and make decisions on programs and funding levels. The audit is a continuation of our oversight of NASA's implementation of GPRA as described in our Results Act Review Plan.

**Objectives.** Our overall audit objective was to assess the quality of data supporting the reported results that will be in the NASA FY 2000 Performance Report. We reviewed the supporting data for 23 performance targets related to 6 critical areas: Procurement, Financial Management, Information Technology, International Space Station, Program and Project Management, and Safety and Mission Assurance.

Appendix A contains further details on the audit objectives, scope, and methodology. Appendix C provides details on the 23 performance targets reviewed.

**Results of Audit.** We considered the supporting data and information on 19 (83 percent) of the 23 performance targets reviewed to be adequate and did not identify any significant problems with reported actual performance. However, the reported performance on four performance targets is not fully reliable because the data reviewed did not accurately support the described results. Given this finding and the results from previous GPRA audits, we surmise that the reported performance for some of the 188 targets not reviewed may also not be fully reliable for the same reasons. NASA could improve the accuracy of the FY 2000 Performance Report by more effectively validating the supporting data and by developing clearer, more specific targets. This would increase the Performance Report's value as a source of information for making important program and funding decisions.

We commend NASA for a significant improvement in the reporting of actual performance. Two factors contributed to this. First, FY 2000 was the second year that the Agency prepared a Performance Report. NASA overcame many of the learning hurdles associated with preparing the first report. Second, the CFO's data call for the FY 2000 Performance Report

prescribed a performance reporting format.<sup>8</sup> For each performance target, a responsible GPRA official was to provide an assessment of actual performance, a description of data sources for the supporting information, and documentation of the method of verification and the process used for validation of results. We believe that the prescribed reporting format led to improved narratives for the performance targets.

**Recommendations.** The responsible GPRA officials should review and correct information on the four targets discussed in this report and verify and validate the supporting data for the other FY 2000 targets not audited to ensure that all reported results in the Performance Report are accurate and reliable; develop future GPRA targets that are clear and represent desired performance; and fully disclose data limitations in future performance reports.

**Management's Response.** Management concurred with the recommendations. NASA management has reviewed and corrected the performance statements for the four performance targets discussed in this report and will include the revised statements in the Agency's final Performance Report. In correspondence to the Strategic Enterprises, Headquarters Offices, and Centers on performance targets for FY's 2002 and 2003, management has emphasized the need to develop clear and measurable performance targets. Management will continue to stress the requirement to report data limitations in future Performance Reports. Beginning with the FY 2002 final Performance Plan, NASA will discuss anticipated data limitations. The complete text of management's response is in Appendix D.

**Evaluation of Response.** Management's planned actions are responsive to the recommendations. A detailed evaluation of management's comments is provided with each recommendation in the body of the report.

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<sup>8</sup> The CFO issued a data call letter for the FY 2000 Performance Report and FY 2000 Accountability Report to the Officials-in-Charge of Headquarters and Functional Offices (September 26, 2000).

## Introduction

During FY 2000, NASA conducted its programs and activities through four Strategic Enterprises that constitute NASA's primary missions. The Strategic Enterprises are Space Science, Earth Science, Human Exploration and Development of Space (HEDS), and Aerospace Technology.<sup>9</sup> Four Crosscutting Processes support the Strategic Enterprises and enable them to perform their mission activities. The four Crosscutting Processes are Manage Strategically, Provide Aerospace Products and Capabilities, Generate Knowledge, and Communicate Knowledge. The Associate Administrator for each Strategic Enterprise is responsible for GPRA performance within the respective Enterprise. For the four Crosscutting Processes, the Associate Administrator for Policy and Plans is responsible for Manage Strategically; the Chief Engineer is responsible for Provide Aerospace Products and Capabilities; and the Chief Scientist is responsible for both the Generate Knowledge and Communicate Knowledge Processes. NASA refers to the responsible GPRA official for each Crosscutting Process as the GPRA Steward.

NASA's Office of Policy and Plans is responsible for developing and implementing the Strategic Plan. The Associate Administrators for the Strategic Enterprises and the GPRA Stewards are responsible for developing and implementing the annual Performance Plan and for reporting on actual performance for the annual Performance Report. The CFO coordinates the performance planning and reporting processes, collecting information from the Associate Administrators for the Strategic Enterprises and the GPRA Stewards to prepare the annual Performance Plan and Performance Report.

NASA Centers are responsible for implementing many of the programs and activities that have GPRA performance goals and targets. Therefore, Center systems were the source for much of the data used to measure and evaluate actual performance. The Associate Administrators for the Strategic Enterprises and the GPRA Stewards collected the data from the Centers, developed a written assessment of the actual performance, and submitted the assessment to the CFO for use in preparing the Performance Report.

In its review of NASA's FY 2000 Performance Plan, the General Accounting Office (GAO) stated that the Plan provides limited confidence that the Agency's performance information is credible. The Plan identifies internal and external organizations that will evaluate performance, provides expanded detail on such evaluations, and identifies specific internal and external sources for data. However, the Plan does not include an explicit discussion of the procedures the Agency will use to verify and validate performance data. In addition, the Plan does not address possible limitations in internal and external sources of data.<sup>10</sup>

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<sup>9</sup> On September 29, 2000, NASA established the Office of Biological and Physical Research, which formed a separate and fifth Enterprise focusing on scientific research. The Associate Administrators for the Office of Space Flight and the Office of Biological and Physical Research are each responsible for separate performance targets in the HEDS Enterprise.

<sup>10</sup> More details on GAO's review are in Appendix B.

We noted in an earlier OIG audit<sup>11</sup> that the Agency lacked specific procedures for NASA program offices to follow in verifying performance data and reported results. NASA management took the position that most of the data used to measure GPRA-related performance came from internal sources, thus additional procedures were not necessary to ensure accuracy and reliability. Details of the prior audit are in Appendix B. In another audit of the supporting data for selected performance targets in NASA's FY 1999 Performance Report,<sup>12</sup> we considered the reported performance on five targets reviewed as not fully reliable. We found that the supporting data did not accurately support the results described.

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<sup>11</sup> Report Number IG-99-055, "NASA Implementation of the Government Performance Results Act," was issued September 28, 1999. The report discusses NASA's efforts to develop and use performance measures for determining progress toward achieving the performance goals and program outcomes described in its annual performance plans and performance reports under the GPRA.

<sup>12</sup> Report Number IG-00-020, "Validating FY 1999 Performance Data to Be Reported Under the Government Performance Results Act," was issued March 28, 2000. The report discusses the accuracy and reliability of supporting data for selected performance targets. See Appendix B for details.

## **Finding and Recommendations**

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### **Reliability of Data for Reported Results**

For 4 (17 percent) of 23 performance targets reviewed, responsible GPRA officials prepared written assessments that did not accurately reflect supporting data and actual results. This occurred because the officials did not consistently follow procedures in place to verify and validate supporting data and the results. Also contributing to the problems were poor phrasing of some targets. The planned reported performance on these four targets is, therefore, not fully reliable, which may limit the usefulness of the information to NASA, OMB, and the Congress for decisionmaking. Reported performance for some of the 188 targets not reviewed may also not be fully reliable for the same reasons. Management attention is needed to address and correct these problems before issuing future Performance Reports.

### **GPRA Requirements**

GPRA requires an agency to prepare an annual Performance Report that compares actual performance with the performance targets set out in the annual Performance Plan. When a performance target is not met, the Performance Report should include an explanation for not achieving a performance target and describe steps for meeting the goal in the future. For the annual Performance Report to be useful, the data on the actual achievements on the Agency's performance goals and targets and the comparisons of planned and actual performance must be accurate.<sup>13</sup> GPRA further requires the annual Performance Plan to include a description of the means used to verify and validate measured values. Also, to have accurate measurements of actual performance, it is important that the targets are described in the Plan in a manner that ensures the planned achievements and how they are measured are clear.

### **Verifying and Validating Supporting Data and Results**

NASA's FY 2000 Performance Plan described, as required by GPRA, the means by which the Agency would verify its performance data. The primary means were reviews by internal and external groups. Internally, standard monthly and quarterly project- and program-level reviews occur at the Centers, at contractor installations, and at NASA Headquarters. Program Management Councils<sup>14</sup> assess program schedules, cost, and technical performance against established programmatic commitments. External review processes include peer reviews by outside scientific experts to ensure that science research proposals are selected strictly on the

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<sup>13</sup> NASA also includes selected performance information in an Accountability Report, which is issued as part of the annual Financial Statements. We discussed with CFO staff our audit findings on specific targets that were also going to be included in the 2000 Accountability Report so that the CFO staff could take appropriate action.

<sup>14</sup> The Program Management Council is the Senior Management Group, chaired by the Deputy Administrator, responsible for reviewing and recommending approval of programs and for overseeing their implementation according to Agency commitments, priorities, and policies.

merits of the planned research. Other external groups involved with verifying performance data include the OIG, the GAO, and the NASA Advisory Council.<sup>15</sup>

For 19 of the 23 reviewed performance targets that will be in NASA's FY 2000 Performance Report, we did not find any significant problems with the actual performance the Associate Administrators for the Strategic Enterprises and the GPRA Stewards reported. Except for minor errors, the supporting data and manner in which the actual results were reported were generally adequate. However, as evidenced by the four targets discussed below, there could be further improvement in the overall process for validating and verifying all GPRA performance data and reported results. These targets have data limitations or special circumstances that should be discussed in the FY 2000 Performance Report.

**Target 0H13: "Achieve 85% on-time, successful launches, excluding weather risk."**

In January 2000, the Administrator and the Associate Administrator for Space Flight, along with the Space Shuttle Program Manager, believed that the wording of this target might be interpreted as compromising safety. Consequently, the officials replaced the target originally included in the FY 2000 Performance Plan with the following: "Achieve 100% on-orbit mission success." For the FY 2000 Performance Report, NASA plans to report that it failed to achieve the original target but that it has achieved the desired performance for the replacement target. We believe, however, that the replacement target is unclear.

The target, as replaced, relates to a program managed by the Office of Space Flight. NASA plans to report that it achieved at least a 100-percent success rate on each of the four Space Shuttle missions completed in FY 2000. In reviewing the data to support this target, we found that the actual measurement was of accomplishment of major mission objectives. We believe that the target, as written, is misleading because it could be assumed that all planned activities for the mission were included in the reported target results.

The Shuttle Program develops objectives for each mission. Depending on the activities planned for the mission, there could be numerous objectives. However, the program prioritizes these objectives, and those that support the primary mission(s) for that flight are documented as Major Mission Objectives that the Shuttle Program will use as performance incentive criteria in the Shuttle Flight Operations Contract. The Office of Space Flight also uses the criteria to judge the success of this performance target (0H13). The Shuttle Program, however, still makes a determination as to whether the other mission objectives were met. They may or may not be achieved. The Shuttle Program

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<sup>15</sup> The NASA Advisory Council and its committees are considered "internal" because they are chartered by NASA, their members chosen by NASA, and they provide their advice and counsel directly to the NASA Administrator.

also develops metrics for the success of the mission considering the success of all the payloads and the success of the Shuttle in providing the promised support for the payload customer.

If NASA plans to use the replacement target in future performance plans, it should restate the metric to match the data being measured. For example, “Achieve 100% of major mission objectives.”

**Target 0P2: “Ensure the availability of NASA’s spacecraft and ground facilities by decreasing the FY99 unscheduled downtime.”** This target was one of the crosscutting performance targets in the FY 2000 Performance Plan that affects the process by which NASA’s Strategic Enterprises and their Centers deliver systems (ground, aeronautics, and space); technologies; data; and operational services (which includes space networks) to NASA customers. The target relates to the Provide Aerospace Products and Capabilities Crosscutting Process, which the Office of the Chief Engineer manages. NASA plans to report that the target was achieved. In reviewing the target, we identified data limitations in the way performance results were written. Therefore, we do not consider the reported assessment to be complete and accurate.

**Spacecraft.** Concerning the spacecraft portion of target 0P2, the reported performance data was limited to specific spacecraft and space networks. For example:

- The Office of Space Science submitted data showing downtime only for spacecraft at Goddard Space Flight Center and the Jet Propulsion Laboratory. Spacecraft at the Marshall Space Flight Center were not included in the reported data.
- The Office of Space Flight reported on two of three space networks: Space Network - TDRS and the Deep Space Network. The Wide-Area Network was not included in the reported data.

In both instances, the data submitted to the Office of the Chief Engineer clearly identified the spacecraft and space networks that the performance data represented. However, the reported performance results submitted for the NASA Performance Report did not indicate that the reported unscheduled downtime did not include all NASA spacecraft and space networks.

**Ground Facilities.** NASA’s major facility managers were instructed to input downtime data into a Web site by a specified date. Immediately after the deadline passed, the Office of the Chief Engineer accessed the site to retrieve the data. The data showed that Kennedy Space Center (Kennedy) and Wallops Flight Facility (Wallops) had not reported any data on downtime for their ground facilities. According to the Office of the Chief Engineer, all ground facilities were included in the reported downtime data. We contacted the performance target point of contact for ground facilities at Kennedy and Wallops to determine whether they had submitted any data. The supporting data they provided us showed that Kennedy had input data subsequent to the cutoff date but that Wallops still had not. The Office of the Chief Engineer, however, could not provide supporting data showing that the data originally retrieved from the Web site and used to report performance against this target had been updated to include the data eventually input into the Web site by Kennedy. Thus, based on the supporting data

received, we were unable to determine whether all facilities were included in the downtime calculation. The Office of the Chief Engineer did not disclose the data limitations of the supporting data for this performance target when that office submitted the performance assessment to the CFO.

**Target 0R10: “Complete NSTAR [NASA Solar Electrical Propulsion Technology Application Readiness] Mission Profile (100% design life) ground testing for Deep Space –1 (concurrent, identical firing of an NSTAR engine in a vacuum chamber with the actual firing sequence of the in-flight propulsion system).”** This target relates to the expansion of space research and exploration under the Office of Aerospace Technology. NASA plans to report that the target was achieved. In reviewing the target performance results, we were concerned with how the target was written. In our opinion, the target performance is unclear as to how NASA measured “design life” and documented the test results.

The CFO format for performance reporting states that documentation of the target accomplishments should include persuasive evidence of performance that is auditable and supportable. Information should be included indicating where the data came from, who verified it, the process that was used to verify it and how it was validated. The reported performance for this target did not contain this information.

To validate supporting data and reported results on this target, we reviewed program assessments performed by NASA’s Office of Aerospace Technology as well as assessments performed independently by other Agency components. The Office of Aerospace Technology performs an assessment of selected aerospace technology programs each month. All programs are subjected to assessment at least once every 3 months. In addition, the Aerospace Technology Committee under the NASA Advisory Council conducted an independent assessment of the targets. The Aerospace Technology Committee concurred with the GPRA assessment prepared by the Aerospace Technology Strategic Enterprise. However, we were unable to obtain auditable documentation for target accomplishments. Therefore, we could not verify whether the target was achieved.

We discussed our concern with Office of Aerospace Technology representatives during the audit. They submitted a rewritten performance results paragraph for the NASA Performance Report. The new paragraph states that “design life equated to the consumption of 87 kilograms of xenon propellant” and that the success of the tests (repeated firings) made ion propulsion a legitimate option for deep space solar system exploration missions. Even with the addition of the information, the paragraph still does not address how NASA documented the test results.

**Target 0Y44: “Focus EOCAP [Earth Observing Commercialization Applications Program] joint commercial applications research to develop 20 new market commercial products (e.g., oil spill containment software by EarthSat; map sheets products by ERDAS, Inc.)”** This target relates to a program managed by the Office of Earth Science under the NASA Commercial Remote Sensing Program. NASA plans to report that it achieved the target performance. In reviewing this target, we determined that all of the 20 products reported as new were not. Therefore, we do not consider the reported assessment to be accurate.

To verify the reported data, we reviewed the Commercial Remote Sensing Program Web site under EOCAP projects. We reviewed the Web page and product description of each company cited in the target and performance assessment and noted the year each was funded. We randomly selected 6 of the 20 companies to contact directly and determine whether their product was released to the market and, if so, when. One of the six products was released commercially in 1996, three in 1997, one in 1999, and one in 2000. Only one of the six products selected was a new market product released in 2000.

The focus of the EOCAP is to broaden the acceptance and use of remote sensing technology in the marketplace by combining market knowledge with technical capability to guide product development based on customers’ needs. NASA shares technical, financial, and product-development risks with private sector companies while providing access to facilities and technical expertise. EOCAP projects are typically 3-year projects. There is a time lag between funding and bringing a product to market. After a project is completed, the entity has 2 years to report on it. The projects cited in the target performance assessment were funded as far back as 1993. A 1993 product would be released commercially by 1996, and the entity would have until 1998 to report on its achievement in the market place. We determined that the actual performance described in the target assessment was inaccurate because most of the reported EOCAP products were already on the market. Therefore, the reported performance on this target is not accurate.

NASA is preparing to issue its second Performance Report. The Agency is still learning how to effectively implement GPRA and measure performance under the Act’s requirements. Though not required by GPRA, NASA plans to identify the data source and the methods used to verify and validate the supporting data for each performance target in its FY 2000 Performance Report. By providing this information, NASA is improving the usefulness of its Performance Report to the Congress, OMB, and others. However, NASA’s GPRA performance measurement process continues to be an area of concern as discussed in this report. Management actions are needed to ensure that all the information in the annual Performance Plans and Performance Reports is reliable and useful to decision makers.

## **Recommendations, Management's Response, and Evaluation of Response**

**The Associate Administrators for the Strategic Enterprises and the GPRA Stewards should:**

- 1. Review the information on the four performance targets discussed in this report as well as the supporting data for all other FY 2000 targets to ensure that results reported in the FY 2000 Performance Report are accurate and reliable.**
- 2. Develop clear, future GPRA targets that appropriately represent the desired performance expected to be achieved.**
- 3. Disclose fully all target data limitations in future performance reports when reporting actual performance.**

**Management's Response.** Concur. Management reviewed the performance statements for the four performance targets and made the necessary corrections or clarifications in the FY 2000 Performance Report. In addition, for each performance target, NASA included a description of the methods used to verify and validate supporting data and identified the data source.

In the FY 2002 Performance Plan data call letter and the FY 2003 performance metric development guidance sent to the Associate Administrators for the Strategic Enterprises and the GPRA Stewards, the CFO emphasized the need to develop clear and measurable performance targets. The guidance on the FY 2003 performance metrics also summarized the characteristics of good performance metrics. To ensure that stakeholders and the public more fully appreciate NASA's planned performance, the NASA Office of Public Affairs incorporated statements of Public Benefit in the FY 2002 Performance Plan. The statements are intended to show how NASA performance targets are relevant to the public and congressional decision makers.

The FY 2000 Performance Report data call letter also emphasized the requirement to report data limitations in performance statements. NASA will continue to emphasize the need to disclose data limitations in future performance reporting. The complete text of management's response is in Appendix D.

**Evaluation of Response.** Management's actions are responsive to the recommendations. The actions taken and planned in response to the recommendations show a strong management commitment to GPRA and a willingness to ensure that all the information in the annual Performance Plan and Performance Report are reliable and useful to decision makers.

## **Appendix A. Objectives, Scope, and Methodology**

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### **Objectives**

The overall objective was to assess the quality of data supporting the reported results that will be contained in the NASA FY 2000 Performance Report. The specific objectives were to review and test selected performance targets to assess: (1) whether the data are appropriate for the performance target and (2) whether the data is complete, accurate, consistent, and timely.

### **Scope and Methodology**

The audit covered targets contained in NASA's FY 2000 Performance Plan. NASA's Plan included 211 performance targets. To perform this audit, we concentrated on targets that fit within six areas considered critical to the Agency: Procurement, Financial Management, Information Technology, International Space Station, Program and Project Management, and Safety and Mission Assurance. Further, we included only performance targets that NASA intended, at the time of our audit, to report as being achieved or exceeded. We also included targets that were similar to those we identified in our audit of FY 1999 targets as not having reliable supporting data. We reviewed 23 performance targets that, in our opinion, met all of the above criteria. Appendix C provides details on the performance targets we reviewed. Although we did not use statistical sampling procedures, we considered the selected targets reasonably representative of all the targets included in NASA's Performance Plan.

To accomplish our objectives we:

- Reviewed GPRA legislation, OMB guidance, and related documentation relative to measuring and reporting performance results.
- Obtained and reviewed, for the selected performance targets, the measured data and information supporting the results that were planned to be included in NASA's FY 2000 Performance Report.
- Interviewed NASA personnel and others who had a role either in collecting and providing the data and information used to measure results or in summarizing and reporting the results.
- Determined, through interviews and reviews of readily available studies or analyses, whether there were known major problems with the systems or sources of the performance data.

## **Appendix A**

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### **Management Controls Reviewed**

We reviewed the following controls with respect to measuring and reporting performance:

- NASA FY 2000 Performance Plan
- NASA Strategic Management Handbook (February 2000)
- Office of the Chief Financial Officer, Office Work Instruction, “Performance Plan Update & Reporting,” HOWI7410-B003
- OMB Circular A-11, “Preparing and Submitting Budget Estimates” (July 12, 1999, and July 19, 2000)
- FY 2000 Performance Report and FY 2000 Accountability Report Data Call Letter from the Chief Financial Officer to the Officials-in-Charge of Headquarters and Functional Offices (September 26, 2000)

Management controls for validating and verifying the reliability of GPRA-related performance data and the reported results are not adequate as discussed in the finding.

### **Audit Field Work**

We conducted field work from November 2000 through February 2001 at NASA Headquarters and Johnson Space Center. We performed the audit in accordance with generally accepted government auditing standards.

## Appendix B. Summary of Prior Audit Coverage

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### NASA Office of Inspector General

**“NASA Implementation of the Government Performance Results Act,” Report Number IG-99-055, September 28, 1999.** The report states that NASA (1) had not made a timely assessment of progress in achieving FY 1999 performance goals and (2) had not established formal procedures to ensure that all the data and information used to evaluate progress and report final results are accurate and reliable. The report contains three recommendations to assist NASA in addressing and correcting these issues. Management concurred with all recommendations.

**“Validating FY 1999 Performance Data To Be Reported Under the Government Performance Results Act,” Report Number IG-00-020, March 28, 2000.** The OIG reviewed the accuracy and reliability of performance data for 23 performance targets to be reported in NASA's FY 1999 Performance Report. We concluded that the supporting data and information on 18 of 23 performance targets reviewed were adequate, and we did not identify any significant problems with reported actual performance for those targets. However, the reported performance on five targets reviewed was not fully reliable because the supporting data did not adequately support the results described. The report contains three recommendations to improve the reliability of reported performance. Management concurred with all recommendations.

### General Accounting Office

**“Observations on the National Aeronautics and Space Administration's Fiscal Year 2000 Performance Plan,” July 20, 1999, GAO-NSIAD-99-186R.** Pursuant to a congressional request, GAO reviewed NASA's plan with a focus on (1) assessing the usefulness of the Agency's plan for decisionmaking and (2) identifying the degree of improvement the Agency's FY 2000 Performance Plan represents over the FY 1999 Plan.

GAO determined that the Agency's plan should be useful to decisionmakers. It provides a limited picture of intended performance across the Agency, a general discussion of strategies and resources the Agency will use to achieve its goal, and limited confidence that performance information will be credible. NASA's FY 2000 Plan represents a moderate improvement over the FY 1999 Plan in that it indicates some degree of progress in addressing the weaknesses identified in GAO's assessment of the FY 1999 Plan.

## Appendix C. Performance Targets Reviewed in Detail

Target Number*	Target Description as Stated in the FY 2000 Performance Plan
0C11	Support no less than 800 portable exhibit loans and send portable exhibits to a minimum of 175 targeted events per year.
0GK13	To implement flight missions, the Earth Science Enterprise will successfully launch one spacecraft and deliver two instruments for international launches, within 10% of budget on average.
0H1	Support an expanded research program of approximately 935 investigations, an increase of ~17% over FY99. Publish 100% of science research progress in the annual OLMSA [Office of Life and Microgravity Science and Applications] Life Sciences and Microgravity Research Program Task Bibliographies and make this available on the Internet.
0H13	Achieve 85% on-time, successful launches, excluding weather risk.
0H26	Develop medical protocols and test the capability of the Crew Health Care System as integrated in the ISS [International Space Station] U.S. Laboratory.
0H43	Reduce the space communications budget submit for FY00 by 30-35% from the FY96 congressional budget submit.
0MS3	Reduce the number of Agency lost workdays (from occupational injury or illness) by 5% from the FY94-96 3-year average.
0MS4	Cost 70% or more of available resources.
0MS5	Of funds available for PBC [Performance Based Contract], maintain PBC obligations at 80% (funds available exclude grants, cooperative agreements, actions <\$100,000, SBIR [Small Business Innovation Research], STTR [Small Business Technology Transfer], FFRDC's [Federally Funded Research and Development Centers], intergovernmental agreements, and contracts with foreign governments or international organizations.
0MS8	Achieve at least the congressionally mandated 8% goal for annual funding to small disadvantaged businesses (including prime and subcontracts, small disadvantaged businesses, HBCU's [Historically Black Colleges and Universities], other minority institutions, and women-owned small businesses).
0P2	Ensure the availability of NASA's spacecraft and ground facilities by decreasing the FY99 unscheduled downtime.
0P7	Increase the amount of leveraging of the technology budget with activities of other organization, relative to the FY99 baseline that is established during the process development
0R10	Complete NSTAR [NASA Solar Electrical Propulsion Technology Application Readiness] Mission Profile (100% design life) ground testing for Deep Space-1 (concurrent, identical firing of an NSTAR engine in a vacuum chamber with the actual firing sequence of the in-flight propulsion system).

\* See the Legend at the end of the table.

## Appendix C

OR14	Achieve a facility utilization customer satisfaction rating of 95 percent of respondents at “5” or better and 80 percent at “8” or better, based on exit interviews.
OR15	Transfer at least 12 new technologies and processes to industry during the fiscal year.
OS6	Prepare the INTEGRAL Science Data Center (ISDC) for data archiving and prepare instrument analysis software for the Spectrometer on INTEGRAL (SPI) instrument within 10% of estimated cost.
OS16	NEAR [Near Earth Asteroid Rendezvous] will successfully orbit 433 Eros and meet primary scientific objectives while not exceeding projected mission cost by more than 10%.
OS49	Information systems R&T [Research and Technology] will demonstrate the search, discovery, and fusion of multiple data products at a major science meeting. Accomplish and document the infusion of five information systems R&T efforts into flight projects or the broad research community. Space science data services shall be acknowledged as enabling for two interdisciplinary collaborations.
OS67	Successful achievement of at least seven of the following eight objectives will be made. (1) Each new Space Science mission will have a funded education and outreach program. (2) By the end of FY00, 10% of all Space Science research grants will have an associated education and outreach program under way. (3) Twenty-six states will have Enterprise-funded education or outreach programs planned or under way. (4) At least five research, mission development/operations, or education programs will have been planned/undertaken in Historically Black Colleges and Universities, Hispanic Serving Institutions, or Tribal Colleges, with at least one project under way in each group. (5) At least three national and two regional educational or outreach conferences will be supported with a significant Space Science presence. (6) At least three exhibits or planetariums shows will be on display. (7) An online directory providing enhanced access to major Space Science-related products and programs will be operational by end of the fiscal year. (8) A comprehensive approach to assessing the effectiveness and impact of the Space Science education and outreach efforts will be under development, with a pilot test of the evaluation initiated.
OY9	Establish a benchmark for global and regional rainfall measurements by combining TRMM [Tropical Rainfall Measuring Mission] measurements with measurements from other sources. Create maps of the diurnal cycle of precipitation for the first time. Combine the existing 10-year data set with TRMM measurements to validate climate models and demonstrate the impact of rainfall on short-term weather forecasting. Distribute through the Goddard DAAC [Distributed Active Archive Center] for ease of access to science and operational users.

## Appendix C

0Y10	Develop/improve methods to couple state-of-art-land surface and sea ice models to a global coupled ocean-atmosphere model and use to predict regional climatic consequences of El Niño or La Niña occurrence in the tropical Pacific. Results of research will be published in the open literature and provided to NOAA's [National Oceanic and Atmospheric Administration] National Climate Prediction Center and the U.S. Navy's Fleet Numeric Prediction Center. Ultimate goal: develop a capability to significantly improve the prediction of seasonal-to-interannual climate variations and their regional climate consequences. The main focus is on North America.
0Y43	Implement at least five joint applications research projects/partnerships with State and local governments in remote-sensing applications.
0Y44	Focus EOAP [Earth Observing Commercialization Applications Program] joint commercial applications research to develop 20 new market commercial products, (e.g., oil spill containment software by EarthSat and map sheets products by ERDAS, Inc.)

\* Legend:

0 refers to FY 2000.

C refers to the Communicate Knowledge Crosscutting Process.

GK refers to the Generate Knowledge Crosscutting Process.

H refers to the Human Exploration and Development of Space Enterprise.

MS refers to the Manage Strategically Crosscutting Process.

P refers to the Provide Aerospace Products and Capabilities Crosscutting Process.

R refers to the Aerospace Technology Enterprise.

S refers to the Space Science Enterprise.

Y refers to the Earth Science Enterprise.

## Appendix D. Management's Response

National Aeronautics and  
Space Administration  
**Headquarters**  
Washington, DC 20546-0001



Reply to Atr of BR

04/23/2001

TO: W/Assistant Inspector General for Auditing  
FROM: B/Acting, Chief Financial Officer  
SUBJECT: Comments on the Draft Report on the Audit of the FY 2000  
Performance Data, Audit A0100500

We would like to take the opportunity to thank you for your evaluation. Your concerns have been incorporated into the final FY 2000 Performance Report.

We concur with your recommendations and have outlined our approach to implementing them in the enclosure.

We have also enclosed our analysis of the performance targets with which you took issue.

A handwritten signature in black ink, appearing to read "Stephen J. Varholy".

Stephen J. Varholy

Enclosures

Distribution:

AE/Mr. Keegan  
AM/Dr. Williams  
AS/Dr. Olsen  
J/Mr. Sutton  
M/Mr. Rothenberg  
P/Ms. Cleggett  
R/Mr. Venneri  
S/Dr. Weiler  
U/Dr. Olsen (Acting)  
Y/Dr. Asrar  
Z/Ms. McCormick

## Appendix D

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Recommendation 1: Review the information on the four performance targets discussed in this report as well as the supporting data for all other FY 2000 targets to ensure that results reported in the FY 2000 Performance Report are accurate and reliable.

We concur with the recommendation. The performance statements for the four performance targets have been reviewed and corrections or clarifications have been added to the final Performance Report. Although not required, NASA also included a verification/validation method and data sources for each performance target in the FY 2000 Performance Report to more clearly substantiate our reported performance. NASA will continue providing this information in future performance reporting.

Recommendation 2: Develop clear future GPRA targets that appropriately represent the desired performance expected to be achieved.

We concur with the recommendation. The development of clear and measurable performance targets has been a focal point for the Office of the Chief Financial Officer as evidenced by NASA's FY 2002 Performance Data call letter. This point was also made clear in the FY 2003 performance metric development guidance disseminated to the Enterprises, Functional Offices, and Centers. This guidance included a specific section that summarized seven characteristics of good performance metrics that the Agency is using to guide us in strong and clear metric development. Specifically, one characteristic is to "Demonstrate relevance – How is the metric relevant to NASA, the Public, and Congressional decision-makers?" The CFO has also established a GPRA Working Group to help foster an open line of communication for the sharing of information and concerns on GPRA-related issues.

In the interest of ensuring that our reported performance is fully appreciated by our stakeholders and the Public, NASA's Office of Public Affairs reviewed the FY 2000 Performance Report and incorporated statements of Public Benefit. A statement of Public Benefit will be included for each target, where possible, in the FY 2002 Performance Plan (and subsequent plans) and the FY 2002 Performance Report (and subsequent reports). A FY 2002 Earth Science Enterprise Strategic Goal, Objective and Public Benefit statement are provided as an example:

Earth Science Enterprise Strategic Objective: Identify the consequences of change in the Earth system for human civilization.

Annual Performance Goal: Increase understanding of variations in local weather, precipitation and water resources and how they relate to global climate variation by meeting two of two performance indicators.

Public Benefit: This activity establishes a basis for determining what changes will be induced by climate trends in the frequency, strength, and path of weather systems, which produce clouds and rain and replenish fresh water supplies.

NASA is committed to continuous improvement in the area of performance metric development as we gain experience within the GPRA performance process.

Recommendation 3: Disclose fully all target data limitations in future performance reports when reporting actual performance.

We concur with the intent of the recommendation. NASA will continue to emphasize the requirement to report any possible data limitation issues and problems (internal or external) in future performance reporting (to include performance data call letters). This requirement was included in the FY 2000 Performance Report data call letter. As provided for in NASA's FY 2002 Final Performance Plan data call letter, any anticipated data limitations will be discussed.

## Appendix D

Specific Office of the Inspector General (OIG) Performance Target Issues:

Performance Target 0H13: "Achieve 85% on-time, successful launches, excluding weather risk."

In January 2000, the Administrator and the Associate Administrator for Space Flight, along with the Space Shuttle Program Manager, believed that the wording of this target might be interpreted as compromising safety; therefore, NASA reported "No longer applicable" against this performance target. Information provided by NASA was not received by the OIG in time to update their report.

Internally the target was replaced with the following: "Achieve 100% on-orbit mission success." This targeted performance was accomplished. (Mission success was defined as the customer requirements for primary payload on-orbit operation, as defined in the Flight Definition Requirements Document.)

The OIG recommended that in future plans, the target should be restated to reflect the actual measure of targeted performance. In the FY 2002 Performance Plan, the Office of Space Flight (OSF) moved the targeted performance to the indicator level under Annual Performance Goal (target) (2H03). OSF also changed the wording of the metric to specifically address the measure of mission success. In the FY 2002 Performance Plan, the indicator will read: "*Achieve 100% on-orbit mission success for all flights in FY 2002. For this metric, mission success criteria are those provided to the prime contractor (SFOC) for purposes of determining successful accomplishment of the performance incentive fees in the contract.*"

Performance Target 0P2: "Ensure the availability of NASA's spacecraft and ground facilities by decreasing the FY 99 unscheduled downtime."

*Spacecraft.* The OIG indicated that reported unscheduled downtime did not include all NASA spacecraft and space networks. The OIG stated that the Office of Space Science submitted data showing downtime only for spacecraft at Goddard Space Flight Center and the Jet Propulsion Laboratory. Spacecraft at the Marshall Space Flight Center were not included in the reported area.

NASA provided information that all spacecraft that were in their normal mission life during FY 2000 were included in the target average. The target was not written to reflect each Center's average spacecraft downtime, but the average for the Agency.

The OIG stated that the OSF reported on two of three space networks but did not include data regarding the on the Wide-Area Network.

NASA commercially purchases the Wide-Area Network services that are *not* NASA-owned and/or operated. This is a purchased telecommunications service.

*Ground Facilities:* The OIG could not determine whether all facilities were included in the downtime calculation.

NASA's Ground Facilities reporting system did have a lag in the data input to the database. The data that was incomplete was subsequently captured. The average downtime actually improved based on the additional information. NASA will ensure that all of the ground data is included in the reported average or an explanation of the data will be included in future performance reporting.

Performance Target 0R10: "Complete NSTAR (NASA Solar Electrical Propulsion Technology Application Readiness) Mission Profile (100% design life) ground testing for Deep Space -1 (concurrent, identical firing of an NSTAR engine in a vacuum chamber with the actual firing sequence of the in-flight propulsion system.)"

The OIG indicated that it was unclear how NASA measured "design life" and documented the test results.

The Office of Aerospace Technology acknowledged that additional supporting information would have helped data confidence. Specific additional data was requested from the organization that conducted the testing and was added to the supporting data package. In addition, the Actual Performance section for this target was modified to strengthen specifics of the testing.

Performance Target 0Y44: "Focus EOCAP (Earth Observing Commercialization Applications Program) joint commercial applications research to develop 20 new market commercial products (e.g., oil spill containment software by EarthSat; map sheets products by ERDAS, Inc.)."

Actual performance for target 0Y44 has been completely re-written based on the OIG finding. Earth Science Enterprise management required a complete reassessment of the actual performance. Supporting documentation for products marketed or under development during the reporting period were as follows: Eight products went to market during FY 2000, one product originally slated for release in FY 2000 went to market in late FY 1999, and twelve projects are still in development. Based on the revised data, targeted performance was not achieved. Performance provided in the report was amended to incorporate this revised data.

## Appendix E. Report Distribution

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### National Aeronautics and Space Administration (NASA) Headquarters

A/Administrator  
AA/Chief of Staff  
AI/Associate Deputy Administrator  
AE/Chief Engineer  
AS/Chief Scientist  
B/Acting Chief Financial Officer  
B/Comptroller  
BF/Director, Financial Management Division  
BR/Acting Director, Resources Analysis Division  
G/General Counsel  
H/Associate Administrator for Procurement  
HK/Director, Contract Management Division  
HS/Director, Program Operations Division  
J/Associate Administrator for Management Systems  
JM/ Director, Management Assessment Division  
L/Acting Associate Administrator for Legislative Affairs  
M/Associate Administrator for Space Flight  
Q/Associate Administrator for Safety and Mission Assurance  
R/Associate Administrator for Aerospace Technology  
S/Associate Administrator for Space Science  
U/Acting Associate Administrator for Biological and Physical Research  
Y/Associate Administrator for Earth Science  
Z/Acting Associate Administrator for Policy and Plans

### NASA Centers

Director, Ames Research Center  
Director, Dryden Flight Research Center  
Director, John H. Glenn Research Center at Lewis Field  
Director, Goddard Space Flight Center  
Director, Jet Propulsion Laboratory  
Acting Director, Lyndon B. Johnson Space Center  
Director, John F. Kennedy Space Center  
Chief Counsel, John F. Kennedy Space Center  
Director, Langley Research Center  
Director, George C. Marshall Space Flight Center  
Acting Director, John C. Stennis Space Center

## **Appendix E**

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### **Non-NASA Federal Organizations and Individuals**

Assistant to the President for Science and Technology Policy  
Deputy Associate Director, Energy and Science Division, Office of Management and Budget  
Branch Chief, Science and Space Programs Branch, Energy and Science Division, Office of Management and Budget  
Director, Acquisition and Sourcing Management Team, General Accounting Office  
Professional Staff Member, Senate Subcommittee on Science, Technology, and Space

### **Chairman and Ranking Minority Member – Congressional Committees and Subcommittees**

Senate Committee on Appropriations  
Senate Subcommittee on VA, HUD, and Independent Agencies  
Senate Committee on Commerce, Science, and Transportation  
Senate Subcommittee on Science, Technology, and Space  
Senate Committee on Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on VA, HUD, and Independent Agencies  
House Committee on Government Reform and Oversight  
House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations  
House Subcommittee on National Security, Veterans Affairs, and International Relations  
House Subcommittee on Technology and Procurement Policy  
House Committee on Science  
House Subcommittee on Space and Aeronautics, Committee on Science

### **Congressional Member**

Honorable Pete Sessions, U.S. House of Representatives

## NASA Assistant Inspector General for Auditing Reader Survey

The NASA Office of Inspector General has a continuing interest in improving the usefulness of our reports. We wish to make our reports responsive to our customers' interests, consistent with our statutory responsibility. Could you help us by completing our reader survey? For your convenience, the questionnaire can be completed electronically through our homepage at <http://www.hq.nasa.gov/office/oig/hq/audits.html> or can be mailed to the Assistant Inspector General for Auditing; NASA Headquarters, Code W, Washington, DC 20546-0001.

**Report Title: Validation and Verification of Selected NASA FY 2000 Performance Data Related to the Government Performance and Results Act (GRPA)**

**Report Number:** \_\_\_\_\_ **Report Date:** \_\_\_\_\_

***Circle the appropriate rating for the following statements.***

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
1. The report was clear, readable, and logically organized.	5	4	3	2	1	N/A
2. The report was concise and to the point.	5	4	3	2	1	N/A
3. We effectively communicated the audit objectives, scope, and methodology.	5	4	3	2	1	N/A
4. The report contained sufficient information to support the finding(s) in a balanced and objective manner.	5	4	3	2	1	N/A

***Overall, how would you rate the report?***

Excellent	Fair
Very Good	Poor
Good	

***If you have any additional comments or wish to elaborate on any of the above responses, please write them here. Use additional paper if necessary.***

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**How did you use the report?** \_\_\_\_\_  
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**How could we improve our report?** \_\_\_\_\_  
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**How would you identify yourself? (Select one)**

Congressional Staff	Media
NASA Employee	Public Interest
Private Citizen	Other: _____
Government: _____	Federal: _____ State: _____ Local: _____

**May we contact you about your comments?**

**Yes:** \_\_\_\_\_ **No:** \_\_\_\_\_

**Name:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_

Thank you for your cooperation in completing this survey.

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