National Aeronautics and
Space Administration

Office of Inspector General
Washington, DC 20546-0001

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TO: Administrator

FROM: Inspector General

SUBJECT: NASA's Most Serious Management and Performance Challenges

As required by the Reports Consolidation Act of 2000, these are our views of the most serious management and performance challenges facing NASA. NASA is working to address these challenges and improve Agency programs and operations through various initiatives and by implementing recommendations made by the Office of Inspector General (OIG) and other evaluative bodies, such as the Government Accountability Office (GAO). An overarching challenge concerns how the Agency integrates diverse programmatic and institutional functions that are geographically dispersed. Each of the five challenges listed below, and summarized in the enclosure, is colored by this overarching challenge.

- **Transitioning from the Space Shuttle to the Next Generation of Space Vehicles.** Effectively planning, implementing, and measuring transition activities while maintaining the capabilities required to fly the Space Shuttle safely and effectively.

- **Managing Risk to People, Equipment, and Mission.** In the context of very challenging launch and mission schedules, ensuring that risk management, safety, and mission assurance controls operate robustly and reliably.

- **Financial Management.** Continuing to resolve internal control problems, which led to four consecutive disclaimers of opinion on NASA's financial statements, including FY 2006, and ensuring that the Integrated Enterprise Management Program (IEMP) improves NASA's ability to accurately allocate costs to programs, efficiently provides reliable information to management, and supports compliance with the Chief Financial Officers Act.

- **Information Technology (IT) Security.** Continuing efforts to enhance IT security by addressing significant weaknesses in controls.

- **Acquisition and Contracting Processes.** Ensuring that requirements are identified before the start of each project and that resources are properly matched with those requirements during the execution of the project.

Transitioning from the Space Shuttle to the next-generation space vehicles, which is key to implementing the President's Vision for Space Exploration,[1] was added as a most serious challenge last year. A draft OIG audit report on the transition process[2] discusses NASA's lack of a comprehensive transition plan that addresses issues critical for efficient and effective management of that process.

The Agency has focused considerable effort on safely returning the Space Shuttle to flight and completing the International Space Station. As a result, we removed the completion of the International Space Station from this year's challenges and refocused last year's challenge of "Continuing to Correct the Serious Organizational and Technical Deficiencies that Contributed to the Columbia Accident in 2003" to "Managing Risk to People, Equipment, and Mission."

NASA's financial management remains on the list of challenges because of continued internal control weaknesses affecting the Agency's ability to produce complete and accurate financial statements. In addition, during FY 2006, we reported on Antideficiency Act violations that the Administrator was required to report to the President, Congress, and the Office of Management and Budget.

Although we removed IT security from last year's list of challenges, we have again included it as a most serious management and performance challenge. The Agency has been responsive to our recommendations, and the Office of the Chief Information Officer has implemented policies and procedures that strengthen the Agency's IT security internal controls. However, our audit and investigative work shows that significant weaknesses persist and many IT security challenges remain.

In the past, various aspects of NASA's acquisition process and contract management have been included as a most serious management challenge. Over the past year, OIG and GAO audits and investigations have revealed additional indications of systemic problems in these areas, leading to the addition of the acquisition and contracting processes as a management challenge this year.

If you have any questions, or need additional information, please call me at 202-358-1220.

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Enclosure

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[1] "A Renewed Spirit of Discovery: The President's Vision for U.S. Space Exploration," January 2004.

[2] The final audit report will be issued in December 2006.

NASA's Most Serious Management and Performance Challenges

Transitioning from the Space Shuttle to the Next Generation of Space Vehicles

As part of the President's 2004 Vision for Space Exploration, NASA was directed to return the Space Shuttle to flight as soon as practical, focus the use of the Space Shuttle to complete the International Space Station (ISS), and retire the Space Shuttle by 2010. With respect to the broader space mission, the President directed NASA to develop new vehicles to provide crew transportation for missions beyond low Earth orbit. One of the key challenges associated with achieving the President's Vision is for NASA to maintain the capabilities required to fly the Space Shuttle safely and effectively while transitioning human capital and critical skills, real and personal property, and related capabilities to support projects within the Constellation Systems Program,[3] such as the Crew Exploration Vehicle (CEV) and the Crew Launch Vehicle (CLV).

To manage the transition, NASA established a Transition Governance Structure comprising transition managers and control boards appointed at the Agency, Directorate, Center, program, and project levels. The Transition Governance Structure includes representatives from two of NASA's four Mission Directorates—the Space Operations Mission Directorate (SOMD) and the Exploration Systems Mission Directorate (ESMD)—and representatives from NASA's Mission Support Offices. SOMD is responsible for operating the Space Shuttle Program (SSP) until its retirement in 2010 and for managing the completion and use of the ISS. ESMD is responsible for the Constellation Systems Program. The Mission Support Offices provide the institutional capabilities to support transition. The responsibilities of the transition managers and control boards include evaluating transition decisions to ensure that the decisions promote efficiencies and synergies between the human space flight programs; ensuring that existing infrastructure and resources evolve to future programs; and ensuring that strategies, decision-making, priorities, budgets, schedules, and top-level development and operational requirements are coordinated among ESMD, SOMD, and the appropriate Mission Support Offices.

In addition to establishing the Transition Governance Structure, NASA also developed a draft transition plan describing how the Agency will transition from operating the Space Shuttle and the ISS to flying the CEV and exploring the Moon and beyond. Version 7 of the draft transition plan, "Human Space Flight Transition Plan," undated, discusses topics such as transition management, acquisition, budget, data and records management, environmental management, human capital, information technology, property, and transition metrics. NASA is also developing the National Space Transportation System 07700, Volume XX, "Space Shuttle Program Transition and Retirement Requirements," to document the requirements for managing the SSP's end-of-program transition.

[3] The Constellation Systems Program is responsible for developing the next-generation space vehicles and the related exploration architecture systems.

The success of the transition effort is dependent on the development of a comprehensive plan for the transition and the timely execution of that plan.[4] The comprehensive plan must focus on transition requirements and how those requirements intersect with the requirements of three major programs involved in transition—Space Shuttle, ISS, and Constellation—recognizing that changes in requirements within any of those programs will not only have an effect on the overall transition effort but may also directly affect the other programs. Since the initial architecture for the next generation of space vehicles was announced, NASA has revised the size, configuration, and hardware for those vehicles and extended the completion date for the CEV. Because the initial architecture was developed to take advantage of SSP technology and workforce assets, the revisions not only impact the acquisition of the new vehicles, but may also impact SSP closeout activities.

The transition effort poses a tremendous challenge to NASA, and the planning, implementing, and measuring of transition requirements should be tracked from the highest management levels of the Agency.

Managing Risk to People, Equipment, and Mission

In FY 2006, NASA launched two Space Shuttle missions to the International Space Station notwithstanding concerns raised by engineers and safety officials. In January 2006, NASA proceeded with the New Horizons launch, also notwithstanding objections from safety and mission assurance officials. We have no basis to question the decision to proceed in any of these launches. Furthermore, we applaud the fact that those who have a technical basis to object to launch of missions are empowered to voice concerns. On the other hand, the lack of technical consensus at late stages of pre-launch activities suggests that launch vehicles' compliance with launch requirements is less than optimal.

In the context of the objective to complete the International Space Station by 2010, where a decision to forgo launching a Space Shuttle mission in a given launch window creates risk to meeting the objective, there is schedule pressure. NASA must guard against this pressure manifesting itself in the acceptance of undue risk. We recognize that the complex effort to balance mission execution in defined timeframes against the imperfections of hardware, while ensuring that a robust process exists for voicing safety and engineering concerns, is a serious performance and management challenge to the Agency.

Financial Management

In FY 2003, NASA converted its accounting data from 10 separate systems to a single Integrated Enterprise Management Program (IEMP). The backbone of IEMP is the Core Financial module. However, despite substantial investment, in both time and money, into the development and implementation of the Core Financial module, NASA still cannot produce

[4] The OIG initiated an audit in January 2006 to evaluate NASA's plans for managing the Space Shuttle's retirement and transition to the CEV and CLV. We expect to issue the audit report in December 2006.

auditable financial statements—a key goal of the module. NASA has made progress in addressing material weaknesses and other deficiencies but improving financial management remains a formidable challenge.

NASA received a disclaimer of opinion on its financial statements as a result of the Independent Public Accountant (IPA) audits in FY 2003 by PricewaterhouseCoopers and in FY 2004, FY 2005, and FY 2006 by Ernst & Young LLP (E&Y) because NASA has been unable to provide auditable financial statements and sufficient evidence to support statements throughout the fiscal year. The IPAs' reports identified instances of noncompliance with generally accepted accounting principles, reportable conditions (with most being material weaknesses) in internal controls, and noncompliance with the Federal Financial Management Improvement Act of 1996 and the Improper Payments Information Act of 2002. Many of the weaknesses the audits disclosed resulted from a lack of effective internal control procedures and data integrity issues.

Two of the most significant material weaknesses involve NASA's internal controls over property, plant, and equipment and materials (PP&E) and the financial statement preparation oversight and process. As shown in the following table, these weaknesses have been reported for several years.

Internal Control Deficiencies						
Fiscal Year		2006	2005	2004	2003	2002
Independent Public Accountant		E&Y	E&Y	E&Y	PwC[1]	PwC
Audit Opinion		Disclaimer	Disclaimer	Disclaimer	Disclaimer	Unqualified
Internal Control Deficiencies	General Controls Environment[2]	—	—	material weakness	reportable condition	reportable condition
	Property, Plant, and Equipment and Materials	material weakness	material weakness	material weakness	material weakness	material weakness
	Financial Statement Preparation Process and Oversight	material weakness	material weakness	material weakness	material weakness	material weakness
	Fund Balance with Treasury[3]	—	material weakness	material weakness	material weakness	—
	Audit Trail and Documentation to Support Financial Statements[4]	—	—	—	material weakness	—
	Environmental Liability Estimation[5]	—	reportable condition	reportable condition	—	—

[1] PricewaterhouseCoopers.

[2] The General Controls Environment weakness had mostly been resolved for FY 2005. The segregation of duties component of this weakness was included in the Financial Statement Preparation Process and Oversight weakness for FYs 2005 and 2006.

[3] The weakness cited for Fund Balance with Treasury reconciliations cited in FY 2005 had mostly been resolved; a weakness relating to timely resolution of Budget Clearing Account balances was included in the overall Financial Statement Preparation Process and Oversight weakness for FY 2006.

[4] The weakness on Audit Trail cited in FY 2003 continued to exist in subsequent years (FYs 2004–2006); however, it was included in the overall Financial Statement Preparation Process and Oversight weakness.

[5] The deficiency cited for Environmental Liability Estimation had mostly been resolved for FY 2006. Control deficiencies surrounding the software application used to prepare the estimates and a lack of appropriate OCFO involvement in related accounting matters were included in the Financial Statement Preparation Process and Oversight weakness for FY 2006.

NASA has made significant progress in correcting two of the four deficiencies noted in FY 2005; specifically, Fund Balance with Treasury (FBWT) and Environmental Liability Estimation. NASA demonstrated its progress in correcting the FBWT material weakness by substantially resolving outstanding reconciliation items from prior periods at year-end and introducing reconciliation procedures that track current period differences. For the Environmental Liability Estimation deficiency, progress was made in documenting the environmental liability estimation process and training the engineers who prepare the estimates.

NASA is also working to ensure that the Office of the Chief Financial Officer (OCFO) is adequately staffed to address its challenges, enhance the OCFO's financial management skills, and provide value-added financial management support to the Agency's mission. In September 2006, the OCFO completed a workforce planning assessment at Headquarters and each Center's OCFO.

Some of the challenges noted in the workforce assessment report are the need for an increase in

- analytical skills, understanding of full-cost accounting, and property accounting;
- project management knowledge;
- succession planning; and
- flexibility to respond to program, process, and policy changes.

The OCFO also needs to fill some key leadership positions, such as the Chief of the External Reporting Branch, who is responsible for preparing NASA's financial statements.

To further address its financial management deficiencies, NASA initiated the Systems, Applications, and Products (SAP) Version Update Project in September 2005 to update the Core Financial module to the most recent version of SAP. NASA plans to implement the update in November 2006. The update contains code fixes and redesigns based on issues encountered in previous versions of the software. Once the update is complete, NASA expects to have the ability to use the Agency's Operating and Execution Plans as the funds distribution control mechanism; establish lower levels of funds control; record commitments and obligations at their time of approval; more efficiently and effectively identify, investigate, and resolve errors on purchase orders; generate cost accruals; and streamline the year-end closing processes. According to NASA, those abilities will enhance its financial tracking and reporting capabilities, which are vital to achieving an unqualified audit opinion.

In response to a request by the House Committee on Science, Subcommittee on Space and Aeronautics, NASA prepared a corrective action plan to address the material weaknesses and recommendations noted in the FY 2005 financial statement audit report. NASA implemented periodic monitoring activities as an Agency-wide key control. These activities include reviewing and analyzing each Center's financial data to identify inaccurate data, abnormal balances, account relationship differences, and other financial reporting anomalies resulting in reporting discrepancies. While these monitoring activities identified issues requiring

immediate attention by NASA management, they could be improved because Headquarters guidance to the Centers is not always clear and is open to interpretation by Center personnel.

NASA still needs to ensure that it develops and implements comprehensive corrective action plans, within parameters set by financial management and accounting laws and regulations, which are the collaborative product of NASA program and institutional leadership. The plans must address the FY 2006 IPA findings and NASA's internally identified material weaknesses noted in the Administrator's Statement of Assurance, and the plans must be detailed enough to ensure successful implementation with desired results. The OIG will continue to work with Agency leadership toward solutions.

Information Technology (IT) Security

Despite the progress NASA made in improving its IT security program, systemic IT security weaknesses persisted and many IT security challenges remain. Specifically, our audits and assessments found recurring and significant internal control weaknesses related to IT security, including patch management, monitoring of critical system activities, backup of systems, and certification of IT systems. In addition, several NASA Centers have experienced IT security incidents, which the OIG is investigating. As a result, NASA's FY 2006 Federal Information Security Management Act report to the Office of Management and Budget identified the IT security program as a material weakness. Elevating NASA's IT security program to a material weakness should help focus management's attention and resource decisions on the program's shortcomings. In addition, the Deputy Administrator has mandated a comprehensive, NASA-wide IT security review that should result in recommendations to improve the Agency's IT security posture.

Because of the sensitivity of IT security vulnerabilities, we are not providing details on specific weaknesses in this document. However, we have provided the Agency detailed information on vulnerabilities as well as recommendations for corrective action in reports and other controlled documents.

Acquisition and Contracting Processes

In a December 2005 report to the Chairmen of the House and Senate Appropriations Committees, we identified a number of trouble areas in NASA's acquisition and contracting processes that were uncovered in our audit and investigative work, including

- inadequate control over Government property held by contractors,
- single-bidder contracts with undefined and changing contract requirements,
- lack of transparency to subcontractors working on NASA programs,
- questionable contract management practices under NASA's Small Business Innovation Research (SBIR) program,

- procurement process abuses by NASA employees and contractors, and
- significant cost overruns in some Agency programs.

GAO first identified NASA's contract management as a high-risk area in 1990 and reiterated that assessment in 2005, citing NASA's lack of a modern, fully implemented integrated financial management system; undisciplined cost-estimating processes in project development; and project mangers' inability to obtain information needed to assess contract progress. Over the past year, GAO audits have revealed additional indications of systemic problems in NASA's acquisition process.

Given that NASA spends about 85 percent of its annual budget on contracts, these weaknesses pose significant challenges to NASA's ability to make informed investment decisions and implement appropriate corrective actions.

Improving Acquisition Integrity. OIG audits and investigations during FY 2006 revealed continued, systemic problems in the contract area. The OIG has worked closely with the NASA Office of the General Counsel to promote NASA's implementation of a new Agency-wide Acquisition Integrity Program, which NASA leadership has endorsed. The program is designed to enhance NASA's internal control framework for ensuring integrity in its contracts, promoting competition in contracting, and identifying and addressing wrongdoing by contractors. As part of this, a remedy coordination official will ensure that there is an Agency-wide approach to NASA's administration of civil, administrative, and contractual remedies resulting from investigations, audits, or other examinations related to procurement activities. The new program will provide NASA with a more structured and thoughtful approach for administering contract remedies, sharing best practices, improving internal controls, and raising employee awareness of procurement fraud indicators.

Competition in Contracting. In December 2003, the OIG received allegations that the Boeing Company unfairly secured a NASA Launch Services task order for 19 NASA expendable launch vehicle missions using proprietary data from Lockheed Martin. An OIG investigation disclosed that Boeing's possession and use of Lockheed's proprietary data plus the unfair advantage the company had gained in the Air Force's Evolved Expandable Launch Vehicle Program contract enabled Boeing to persuade NASA to award the 19 expendable launch vehicle missions on a sole-source basis. NASA received $106.7 million from the $615 million settlement the U.S. Government received from Boeing for its improper use of proprietary data.

Undefinitized Contracts. In 2001, GAO identified undefinitized contracts as an issue requiring NASA management attention. Although the Agency appropriately addressed the findings raised by GAO, the issue has returned. A 2006 OIG audit report[5] on subcontract management noted that NASA took more than a year to definitize a contract action, which increased the risk of unanticipated cost growth and delayed NASA's ability to negotiate a fair

[5] "Subcontract Management by United Space Alliance under the Space Flight Operations Contract" (IG-06-013, August 28, 2006)

and reasonable cost. Another 2006 OIG audit report[6] identified that NASA experienced unanticipated cost growth when it issued a letter directing a contractor to commence building and roof repairs during the aftermath of Hurricane Katrina. NASA had estimated the work effort at $991,000, but because the work effort was unclear, and because there was no *Not-To-Exceed* amount in the "letter contract," the contractor later reported costs exceeding $7 million. Recently, the Agency again identified undefinitized contracts as an area warranting senior management attention and raised the question of whether the Agency had implemented sufficient internal controls to prevent the use of this form of contracting from becoming a management weakness.

Lack of a Knowledge-based Acquisition Framework. GAO found that NASA's acquisition policies lacked major decision reviews beyond the initial project approval phase and lacked a standard set of criteria with which to measure projects at crucial phases in the development life-cycle. In response, NASA agreed to apply a knowledge-based acquisition approach, to include incremental markers that ensured adequate knowledge is attained at key decision points before proceeding to the next project phase. A standardized, knowledge-based acquisition approach will help NASA evaluate competing budgetary priorities and enhance the Agency's ability to make difficult decisions regarding investments and the continuation of projects. It is imperative that results of the decision reviews be monitored and reported to the appropriate decision authority where decision makers can reassess whether continued investment in a program or project is warranted. For example, GAO stated that, to help mitigate risks to the CEV project, NASA must ensure that decision reviews are completed at key junctures during the project's development.

Managing Program Costs. In a review of selected NASA programs, GAO found that NASA lacked the disciplined cost-estimating processes and financial and performance management systems needed to establish priorities, quantify risks, and manage program costs. GAO noted that until NASA has the data, tools, and analytical skills needed to alert program managers of potential cost overruns and schedule delays, allowing them to take corrective action before problems occur, the Agency will continue to face challenges in effectively overseeing its contractors. NASA has experienced cost overruns on some of its major programs, most notably the International Space Station. The Agency has also disclosed that it experienced cost overruns in its effort to return the Space Shuttle to flight and the James Webb Telescope Program.

[6] "Final Memorandum on the Audit of the Management of Hurricane Katrina Disaster Relief Efforts" (ML-06-009, August 29, 2006)