National Aeronautics and
Space Administration

Office of Inspector General
Washington, DC 20546-0001

SEP 1 4 2006

TO: Chief Information Officer

FROM: Assistant Inspector General for Auditing

SUBJECT: Final Memorandum on NASA's Information Technology Capital Planning and Investment Control (Report No. IG- 06-017; Assignment No. A-05-020-00)

Executive Summary

The information technology (IT) capital planning and investment control (CPIC) process defines how the Agency will select IT capital investments; how those capital investments will be controlled to achieve intended cost, schedule, and performance outcomes; and how investment performance will be evaluated once a system or project becomes operational. The overall objective of our audit was to assess the adequacy of NASA's selection, control, and evaluation processes for developing and managing the Agency's IT investment portfolio using the Government Accountability Office (GAO) IT Investment Management (ITIM) framework at five NASA Centers. Specifically, the audit focused on answering the following questions:

- Has NASA developed IT portfolio selection criteria that support its mission, organizational strategies, and business priorities?
- Were NASA's IT investments analyzed according to the Agency's portfolio selection criteria and to ensure that an optimal IT investment portfolio with manageable risks and returns is selected and funded?
- Did NASA review the performance of its investment portfolios at agreed upon intervals and adjust the allocation of resources among investments as necessary?
- Did NASA compare the results of recently implemented investments with the expectations that had been set for them and develop a set of lessons learned from these reviews?

We found that NASA had developed and implemented key selection and control processes needed to manage its Office Automation, IT Infrastructure, and Telecommunications (OAIT) investment portfolio. However, improvements are needed to ensure that all of the Agency's OAIT investments are selected in accordance with the NASA IT CPIC policy. Specifically, we found the following:

- NASA had developed OAIT portfolio selection criteria that supported its mission, organizational strategies, and business priorities. NASA's portfolio selection criteria were consistent with Federal laws, regulations, and guidance pertaining to IT CPIC.

- NASA had developed an OAIT portfolio selection process that was generally consistent with the GAO ITIM framework guidance. However, the Agency's OAIT investments were not always selected in accordance with the NASA IT CPIC policy. Specifically, NASA used the portfolio selection process for only $306 million of the Agency's $702 million OAIT portfolio. As a result, NASA cannot be adequately assured that it is selecting OAIT investments that best meet the needs and priorities of the Agency.

- Center Chief Information Office (CIO) officials used the common portfolio categories inconsistently because the NASA Office of the Chief Information Officer (OCIO) had not established clear requirements mandating use of those categories throughout the Agency. Specifically, the NASA CIO had not included the common portfolio categories in the NASA IT CPIC policy or provided instructions in the policy mandating the use of those categories.

- NASA periodically reviewed the performance of the OAIT portfolio investments and adjusted the allocation of resources as needed, based on the results of those reviews. NASA's performance reviews were consistent with Federal laws, regulations, and guidance pertaining to IT CPIC.

- We were unable to assess NASA's procedures for comparing the results of recently implemented OAIT investments with the expectations that were set for them. The NASA IT CPIC policy establishes the requirement to perform a post-implementation review after an IT investment is completed. However, at the time of our review, management asserted that NASA had not yet performed a post-implementation review of an OAIT investment because the Agency had not fully implemented any new OAIT investments since the NASA IT CPIC policy was issued in September 2004.

- Because of the weaknesses in the Centers' implementation of the portfolio selection process, we concluded that the NASA CIO and CIO Board would have been unable to effectively carry out their responsibilities for ensuring consistency of Center-recommended IT investments with the Agency's overall IT architecture.

Our June 16, 2006, draft of this memorandum recommended that the NASA CIO establish clear requirements mandating compliance with NASA's IT CPIC policy and use of common portfolio categories throughout the Agency. We also recommended that the NASA CIO review Centers' IT CPIC submissions to ensure that Centers comply with established policy. Lastly, we recommended that the NASA CIO ensure that all investments in the OAIT portfolio undergo the portfolio selection process as specified in

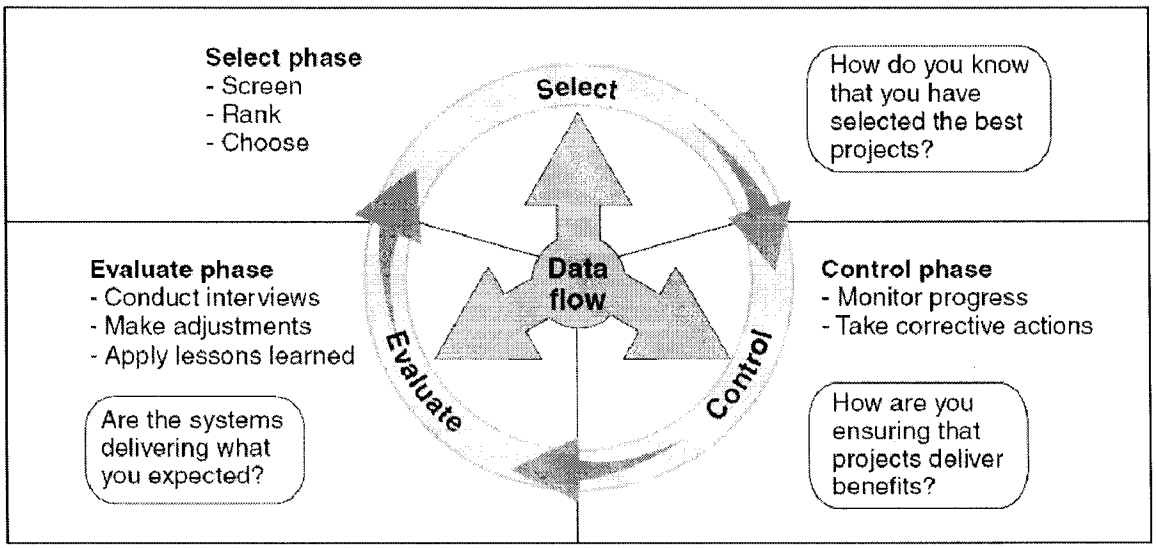
the NASA IT CPIC policy during the next (budget year [BY] 2008) IT capital planning cycle. See Enclosure 1 for details of the audit's scope and methodology, scope limitation, and our review of internal controls.

In response to a draft of this memorandum (see Enclosure 4), management concurred with all three recommendations. We consider management's comments on all three recommendations to be responsive. We have closed Recommendation 2. We consider Recommendations 1 and 3 resolved, but they will remain open until all actions have been completed and verified.

Background

Clinger-Cohen Act. The Clinger-Cohen Act of 1996 establishes statutory requirements for maximizing the value and managing the risks of Federal agencies' major information systems initiatives. The Act states that agencies shall establish a capital planning process that provides for the selection of IT investments, the management (i.e., control) of such investments, and the evaluation of investment results. The Act further states that the planning process shall be integrated with budget, financial, and program management decision making, and include minimum criteria to be applied in considering whether to undertake a particular investment in information systems. GAO developed a graphic representation of the capital planning process, as shown below.

Figure 1: Fundamental Phases of the IT Capital Investment Process



Source: GAO. Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity" (GAO-04-394G, March 2004), p. 8.

NASA Procedural Requirement. In September 1998, the NASA CIO issued NASA Procedural Requirement (NPR) 2800.1, "Managing Information Technology," to

establish policies for planning, acquiring, managing, and using IT to accomplish the Agency's missions and programs efficiently, effectively, and securely. The NPR defined NASA's IT CPIC framework and was intended to satisfy the requirements of the Clinger-Cohen Act but did not include the detailed implementation procedures needed for a comprehensive Agency-wide IT CPIC process.

GAO ITIM Framework. In March 2004, GAO issued an Executive Guide titled, "Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity" (GAO-04-394G, March 1, 2004). This ITIM framework, which is based on the Clinger-Cohen Act, describes the critical processes and key practices that are characteristic of a mature investment management process.

The GAO ITIM framework is a model composed of five progressive stages of maturity that an agency can achieve in its IT investment management capabilities. These maturity stages are cumulative; that is, in order to attain a higher stage of maturity, the agency must have institutionalized all of the requirements for that stage in addition to those for all of the lower stages. For each maturity stage, the ITIM describes a set of critical processes that must be in place for the agency to achieve that stage. For the BY 2007 OAIT portfolio, NASA reported to the Office of Management and Budget (OMB) that the Agency "is considered to be at level 3" of the GAO ITIM framework.

Figure 2: The Five ITIM Stages of Maturity with Critical Processes

Maturity stages	Critical processes
Stage 5: Leveraging IT for strategic outcomes	- Optimizing the investment process - Using IT to drive strategic business change
Stage 4: Improving the investment process	- Improving the portfolio's performance - Managing the succession of information systems
Stage 3: Developing a complete investment portfolio	- Defining the portfolio criteria - Creating the portfolio - Evaluating the portfolio - Conducting postimplementation reviews
Stage 2: Building the investment foundation	- Instituting the investment board - Meeting business needs - Selecting an investment - Providing investment oversight - Capturing investment information
Stage 1: Creating investment awareness	- IT spending without disciplined investment processes

Source: GAO. "Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity" (GAO-04-394G, March 2004), p. 29.

NASA's IT CPIC Policy. In September 2004, the NASA CIO established a comprehensive Agency-wide IT CPIC process by issuing the "NASA Information Technology Capital Planning and Investment Control Process." The IT CPIC policy was

issued by the NASA CIO as an internal NASA requirement. NASA Policy Directive 1400.1I, "Documentation and Promulgation of Internal NASA Requirements," March 3, 2005, states that an internal NASA requirement is a statement of mandatory instructions, imposed by NASA, that a NASA employee or organization must perform.

NASA's IT CPIC policy established the three phases of the IT capital investment process according to Federal requirements and guidance. NASA's CPIC policy defines how the Agency will select IT capital investments based on how well those investments will support the organization's mission, comply with Enterprise Architecture standards, and support NASA's Information Resources Management Strategic Plan. The CPIC policy also defines how those capital investments will be controlled for cost, schedule, and quality performance until implementation is complete or the investment is terminated. Finally, the CPIC policy defines how investment performance will be evaluated once a system or project becomes operational.

For internal portfolio management purposes, NASA established three IT investment portfolios:

- **OAIT.** Core IT services provided across the NASA community (e.g., desktop computing, telecommunications).
- **Program-Unique IT.** Infrastructure, products, and services that are either physically embedded in a flight or test article, or exist solely to meet the requirements of a single, specific program or project.
- **Multi-Program/Project IT.** IT infrastructure, products, and services that are not part of OAIT but do meet IT requirements that are not unique to a single program or project.

Roles and Responsibilities. Management responsibility for NASA's IT CPIC process resides at several levels of the Agency's organizational structure.

- The NASA CIO is responsible for establishing and updating NASA's IT CPIC processes, including procedures and guidelines for screening, scoring, ranking, and selecting IT investments. The NASA CIO also leads the investment review process.

- The CIO Board is responsible for establishing the IT investment strategy for the Agency; approving criteria for the selection, control, and evaluation of IT investments; assessing Business Cases for IT investments; ensuring IT is effectively managed; and ensuring that IT investments are consistent with the overall Agency-wide architecture. The CIO Board is chaired by the NASA CIO and includes the Mission Directorate and Center CIOs.

- The NASA CIO relies on Mission Directorate and Center CIOs to execute the CPIC process and recommend priority of investments. This includes ensuring

that all IT investments are appropriately aligned with the investment portfolios and that the appropriate analysis is conducted to identify and prioritize a set of IT investments that will enable mission success.

In response to an OIG Memorandum ("Review of Organizational Structure and Management of Information Technology and Information Technology Security Services at NASA," IG-05-013, March 30, 2005) concerning NASA's IT organizational structure, NASA is currently considering potential changes to the organizational structure for managing its IT and IT security. These changes may significantly impact the Agency's IT CPIC process by changing the organizational structure and the authorities of those officials responsible for implementing that process.

ITIM Guidance and NASA Requirements

For the CPIC selection and control phases, NASA had developed and implemented a CPIC policy that contained key processes needed to manage its OAIT investment portfolio on the basis of GAO guidance.

The GAO ITIM framework recommends that Agencies develop portfolio selection criteria that support their missions, organizational strategies, and business priorities; and analyze IT investments according to the portfolio selection criteria developed in the selection phase. According to the framework, a critical process in developing a complete IT investment portfolio involves defining appropriate cost, benefit, schedule and risk criteria to ensure that selected investments will satisfy organizational strategies, objectives, and mission. Because portfolio selection criteria are developed to reflect the strategic focus of the organization, those criteria should be applied as uniformly as possible throughout the organization to ensure consistent decision making and that processes become institutionalized.

The GAO ITIM framework also recommends that agencies review the performance of investment portfolios at regular intervals in the control phase. According to the ITIM framework, agency investment boards should ensure appropriate executive-level involvement and participation in monitoring each investment's progress. Periodic performance reviews, based on investment expectations, should examine costs incurred, benefits attained, current schedule, accuracy of project reporting, and risks that have been mitigated, eliminated, or accepted to date.

The "NASA Information Technology Capital Planning and Investment Control Process," September 2004, establishes the Agency's policy and procedures governing IT CPIC and identifies NASA's portfolio selection criteria. According to the NASA IT CPIC policy, the CIO Board prioritizes proposed IT investments and decides which ones to include in NASA's IT investment portfolio. These investments are systematically scored using objective criteria related to mission benefits, compliance with Enterprise Architecture, costs, and risks. The investments are then ranked and compared to other investments.

NASA's CPIC policy also requires periodic reviews of IT investments in the control phase to determine how mission requirements might have changed and whether investments continue to fulfill ongoing and anticipated mission requirements. According to the policy, decisions to continue, modify, or terminate investments are made based on the results of these performance reviews.

On the basis of our review of the GAO ITIM framework and NASA IT CPIC policy, we concluded that NASA's OAIT portfolio selection phase had adequate criteria to support its mission, organizational strategies, and business priorities and was generally consistent with the GAO ITIM framework guidance. However, we found problems with the implementation of the selection process as discussed in the next section. For the control phase, we reviewed the performance review process NASA developed for its OAIT portfolio investments and determined that NASA's performance review process was consistent with GAO guidance. To determine whether critical processes and key practices had been applied, we selected and reviewed a random sample of 19 investments valued at $57.1 million at five NASA Centers. Specifically, we reviewed the investments as case studies to assess whether Centers' performance review processes were implemented in accordance with the NASA IT CPIC policy and GAO ITIM guidance. For the control phase, we reviewed Centers' performance review practices and documentary evidence of executed practices. For this phase, we concluded that NASA periodically reviewed the performance of the OAIT portfolio investments and adjusted the allocation of resources as needed.

Incomplete and Inconsistent Implementation of the Required Selection Process

NASA's OAIT investments were not always selected in accordance with the Agency's IT CPIC policy. Specifically, NASA's implementation of its required portfolio selection process was incomplete and was performed inconsistently by the Centers. Incomplete implementation occurred because the NASA IT CPIC policy is relatively new and full integration within the Agency's existing IT budgeting process will take more than one capital planning cycle. Inconsistent implementation occurred because the NASA CIO had not established clear requirements mandating compliance with NASA's IT CPIC policy and use of common portfolio categories throughout the Agency or reviewed the Centers' CPIC submissions to ensure that Centers complied with established policy. As a result, NASA cannot be adequately assured that it is selecting OAIT investments that best meet the needs and priorities of the Agency.

The NASA IT CPIC policy establishes a scoring methodology for objectively assessing and prioritizing alternative IT investments and selecting those that are most likely to meet mission needs and be made operational on time and within budget. The policy provides the following overview of the portfolio selection process:

> . . . the CIO Board prioritizes each proposed investment and decides which will be included in the NASA portfolio for approved General Purpose IT investments. Submissions are assessed against a uniform set of evaluation criteria and thresholds.

> The investments are systematically scored using objective criteria and the investment is ranked and compared to other investments.

According to the NASA IT CPIC policy, "Weights are assigned to each criteria category and criterion within them to further prioritize the factors NASA considers to be the most significant." The policy specifies that the scoring criteria must include four major criteria categories:

- agreement with strategic direction and operational impact;
- resource and financial factors;
- Enterprise Architecture and technical considerations; and
- program performance factors—cost, schedule, outcome, and risk.

Incomplete Implementation. We reviewed evidence of the OAIT portfolio selection process that supported amounts reported to OMB in NASA's Exhibit 53 for BY 2007. (See Enclosure 2 for a summary of NASA's BY 2007 IT investment totals.) We found that the NASA CIO had not fully implemented the portfolio selection process established in the NASA IT CPIC policy. Specifically, NASA used the portfolio selection process for only $306 million of the Agency's $702 million OAIT portfolio. For the remaining portion of the OAIT portfolio, NASA used the IT budgeting process that existed prior to issuance of the Agency's IT CPIC policy in September 2004. NASA's incomplete implementation of the portfolio selection process was the result of a decision by the NASA CIO to apply selection and prioritization procedures only to IT Service Activity (ITSA) investments[1] rather than to all investments in the OAIT portfolio.

Another factor contributing to the incomplete implementation of the portfolio selection process is that the NASA IT CPIC policy is relatively new and full integration within the Agency's existing IT budgeting process will take more than one capital planning cycle due to the complexity of both processes. The BY 2007 capital planning cycle, which was conducted during calendar year 2005, was the first implementation cycle following issuance of the NASA IT CPIC policy in September 2004. According to NASA CIO officials, the decision to apply selection and prioritization procedures only to ITSA investments was made to provide a manageable phase-in of the Agency's portfolio selection process. Although we understand the reasons for management's decision to phase in the portfolio selection process, we believe the NASA CIO should act aggressively to ensure that the entire OAIT portfolio undergoes the required selection process during the next (BY 2008) IT capital planning cycle.

Inconsistent Implementation of the Portfolio Selection Process. NASA used the required portfolio selection process for $306 million of the Agency's OAIT portfolio, but that process was performed inconsistently by the Centers. We reviewed evidence of the portfolio selection process performed at five NASA Centers. Those five Centers applied

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[1]ITSA investments relate to those OAIT costs that cannot be specifically identified with a particular project. Examples include costs for Centers' telephone systems, video distributions systems, and intrusion detection and incident response systems.

the required portfolio selection process to OAIT investments with a total value of $212.3 million. We found that the selection process at Johnson Space Center (Johnson) and Marshall Space Flight Center (Marshall) was implemented in accordance with Agency policy and was applied to $77.7 million of OAIT investments. However, the selection process at the other three Centers we reviewed was not implemented in full compliance with Agency's IT CPIC policy as described below. The selection process at those three Centers was applied to OAIT investments with a total value of $134.6 million.

- **Goddard Space Flight Center (Goddard).** Officials from the Goddard CIO Office did not use the objective investment scoring methodology required by the NASA IT CPIC policy. Instead, Goddard officials subjectively prioritized the Center portfolio of 54 investments based on "the individual knowledge, experience, and insight of the GSFC CIO and staff." Goddard CIO officials advised us that they did not comply with NASA's portfolio selection procedures because they believed the NASA IT CPIC policy existed only as a guidance document. Goddard officials believed that Centers were not obligated to comply with a policy unless it was issued as an NPR. Although NASA's IT CPIC policy was issued as an internal NASA requirement rather than as an NPR, compliance with the policy is mandatory.

- **Langley Research Center (Langley).** Officials from the Langley CIO Office developed and used a high, medium, or low investment scoring methodology rather than the scoring methodology required by the NASA IT CPIC policy. Specifically, Langley CIO officials scored 15 investments as high priority, 16 investments as medium priority, and 4 unfunded investments as low priority. Langley CIO officials did not believe they were required to comply with the Agency's objective scoring methodology, so they devised a three-tier scoring methodology that they considered reasonable.

- **Kennedy Space Center (Kennedy).** In form, Kennedy complied with the required portfolio selection process. Specifically, Kennedy scored each investment using the four major criteria categories as required by the NASA IT CPIC policy. Substantively, however, Kennedy applied a subjective 4-tier scoring methodology. Of the 78 investments in Kennedy's portfolio, the top 63 investments (approximately 80 percent) received an identical score of 100 points out of a maximum of 100. Assigning the same score to so many investments may undermine the value of the portfolio selection process and is not consistent with the objective scoring methodology required by NASA policy. Kennedy CIO officials believed that they had implemented the portfolio selection process in accordance with Agency policy and direction from the NASA CIO.

Center CIO officials implemented NASA's portfolio selection process inconsistently because some of those officials believed that compliance with the NASA IT CPIC policy was not mandatory. Additionally, the NASA CIO did not adequately review Center IT

CPIC submissions to ensure that they complied with the Agency's portfolio selection process.

Inconsistent Use of the Common Portfolio Categories. We also observed inconsistencies in the way that NASA Centers categorized their OAIT investments. The NASA CIO had developed a set of common portfolio categories and provided a detailed description of those categories to OMB in the Agency's BY 2007 Exhibit 300 for OAIT. (See Enclosure 3 for a listing of NASA's OAIT common portfolio categories.) However, we reviewed investments in Center OAIT portfolios and found inconsistent use of the Agency's common portfolio categories. We also reviewed 10 Centers' submissions to the NASA CIO showing prioritized lists of their ITSA investments and found that only five Centers had classified their ITSA investments using the common portfolio categories.[2] According to the GAO ITIM framework, the use of common portfolio categories enhances management decision making during the portfolio creation process. It allows projects to be prioritized within their own portfolio categories and it keeps dissimilar projects from competing against each other.

Center CIO officials used the common portfolio categories inconsistently because the NASA CIO had not established clear requirements mandating use of those categories throughout the Agency. Specifically, the NASA CIO had not included the common portfolio categories in the NASA IT CPIC policy or provided instructions in the policy mandating the use of those categories.

The NASA CIO is implementing improvements to the portfolio selection process for the next (BY 2008) capital planning cycle. One of these improvements is to require Agency-wide use of a standard data collection template. According to NASA CIO officials, use of this template should bring consistency to the way that Centers categorize the investments in their OAIT portfolios. Despite this planned improvement, the NASA CIO should establish clear requirements to ensure consistent Agency-wide use of the common portfolio categories.

Until all policy requirements have been clearly identified and NASA has fully implemented its policy, NASA cannot be adequately assured that it is selecting OAIT investments that best meet the needs and priorities of the Agency. Moreover, until NASA fully implements its IT CPIC policy, the Agency could be exposed to escalating project costs, duplicative and ineffective systems, unmitigated technical risks, slippages in project schedules, and low-value mission or business benefits.

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[2] The five Centers that did not use the common portfolio categories to classify their ITSA investments were Ames Research Center, Dryden Flight Research Center, Goddard, Johnson, and Kennedy.

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

Recommendation 1. We recommended that the NASA Chief Information Officer establish clear requirements mandating compliance with NASA's IT CPIC policy and use of common portfolio categories throughout the Agency.

Management's Response. Management concurred, stating that a revised NASA IT CPIC policy is being reviewed to require use of common portfolio categories throughout the Agency.

Evaluation of Management's Response. Management's corrective action is responsive to the recommendation. The recommendation is resolved but will remain undispositioned and open for reporting purposes until corrective actions have been completed and we have reviewed supporting documentation.

Recommendation 2. We recommended that the NASA Chief Information Officer review Centers' IT CPIC submissions to ensure that Centers comply with established policy.

Management's Response. Management concurred, stating that a review of Centers' IT CPIC submissions for compliance with established policy was completed in June 2006.

Evaluation of Management's Response. Management's corrective action is responsive to the recommendation. We requested documents to show that the NASA Chief Information Officer had conducted the review of Centers' IT CPIC submissions. We received the supporting documentation on August 30, 2006, and reviewed the documents. On the basis of our review of the supporting documentation, we consider the recommendation to be closed for reporting purposes.

Recommendation 3. We recommended that the NASA Chief Information Officer ensure that all investments in the OAIT portfolio undergo the portfolio selection process, as specified in the NASA IT CPIC policy, during the next (BY 2008) IT capital planning cycle.

Management's Response. Management concurred, stating that the OAIT portfolio is undergoing a portfolio selection process that will continue until all budgets are submitted for incorporation into the President's budget for BY 2008.

Evaluation of Management's Response. Management's planned action is responsive to the recommendation. The recommendation is resolved but will remain

undispositioned and open for reporting purposes until corrective actions have been completed and we have reviewed supporting documentation.

We appreciate the courtesies extended the audit staff during the review. If you have any questions, or need additional information, please contact Ms. Wen Song, Information Technology Director, at 202-358-2588 or me at 202-358-2572.

Evelyn R. Klemstine

Evelyn R. Klemstine

4 Enclosures

cc:
Administrator
Deputy Administrator
Director, Management Systems Division

Scope and Methodology

We conducted audit fieldwork at NASA Headquarters, Goddard, Johnson, Kennedy, Langley, and Marshall from July 2005 through May 2006 in accordance with generally accepted government auditing standards.

To identify Federal laws, regulations, and guidance pertaining to IT CPIC, we reviewed the Paperwork Reduction Act of 1995, the Clinger-Cohen Act of 1996, and the GAO ITIM framework, March 2004.

To determine whether NASA had developed appropriate OAIT portfolio selection criteria, we reviewed the "NASA Information Technology Capital Planning and Investment Control Process," September 2004. This internal NASA requirement establishes the Agency's policy and procedures over IT CPIC and identifies the portfolio selection criteria. We also interviewed NASA CIO officials, Mission Directorate CIOs, Center CIOs, and other personnel having responsibility for establishing and implementing the Agency's IT CPIC policy.

To assess whether NASA's OAIT investment portfolio was selected in accordance with the Agency's IT CPIC policy, we reviewed evidence of the portfolio selection process performed at Goddard, Johnson, Kennedy, Langley, and Marshall. The 5 Centers were judgmentally selected from a universe of 10 NASA Centers. Judgmental sample results do not generalize to the universe.

To assess whether NASA periodically reviewed the performance of the OAIT portfolio investments and adjusted the allocation of resources, we selected and reviewed a random sample of investments at the five Centers identified above to determine whether critical processes and key practices had been applied. Specifically, we reviewed a sample of 19 investments valued at $57.1 million as case studies to assess whether Centers' performance review processes were implemented in accordance with the NASA IT CPIC policy and the GAO ITIM guidance. The sample was drawn from a universe of 226 investments valued at $512.7 million. As part of our review, we submitted audit questionnaires asking about Centers' performance review practices, interviewed Center CIO officials, and reviewed documentary evidence of executed practices.

Scope Limitations

We limited the scope of this review to assessing NASA's OAIT portfolio as reported to OMB. During BY 2007, NASA expects to invest more than $702 million in the OAIT portfolio. However, CPIC for investments in the Program-Unique and Multi-Program/Project portfolios is largely embedded within the overall capital planning process applicable to NPR 7120.5C, "NASA Program and Project Management Processes and Requirements," March 22, 2005. This review did not include assessing the adequacy of the NPR capital planning process and reviewing the Program-Unique and Multi-

Program/Project portfolios for compliance. For more information about the NASA IT investment portfolios and the Agency's reporting to OMB, see Enclosure 2.

We were unable to assess NASA's evaluation phase procedures for comparing the results of recently implemented OAIT investments with the expectations that were set for them. The NASA IT CPIC policy establishes the requirement to perform a post-implementation review after an IT investment is completed. However, at the time of our review, management asserted that NASA had not yet performed a post-implementation review of an OAIT investment because the Agency had not fully implemented any new OAIT investments since the NASA IT CPIC policy was issued in September 2004. We did not perform sufficient audit procedures to ascertain the accuracy and reliability of management's assertion; however, nothing came to our attention to cause us to question the accuracy and reliability of that assertion.

Use of Computer-Processed Data

We relied on data reported to OMB on NASA's BY 2007 Exhibit 53, NASA IT Investment Portfolio. That data was based on Center inputs into a commercial software application. Due to time and resource limitations, we did not perform sufficient audit procedures to ascertain the accuracy and reliability of Center inputs into that application or the accuracy and reliability of application processing. As a result, the reported value of the NASA OAIT portfolio may be over- or understated.

Internal Controls

We identified and tested internal controls designed by NASA to help ensure compliance with applicable Federal laws, regulations, and guidance pertaining to IT CPIC. For example, we tested internal controls relating to development of policies and procedures, assignment of authority and responsibility, and provision of resources and training. We also tested internal controls relating to the implementation of NASA's IT CPIC policies. Such controls included management review of Centers' portfolio selection and control processes.

As discussed in the memorandum, we identified management control weaknesses that resulted in inconsistent implementation of the NASA IT CPIC policy. Management's implementation of the recommendations made in this report should correct those weaknesses.

Prior Coverage

During the last 5 years, the GAO issued one report and an Executive Guide, and the NASA Office of the Inspector General issued one memorandum of particular relevance to the subject of this report. Unrestricted reports can be accessed over the Internet at http://www.gao.gov (GAO) and http://www.hq.nasa.gov/office/oig/hq/audits/reports/fy05/index.html (NASA).

Government Accountability Office

"Information Technology Management: Governmentwide Strategic Planning, Performance Measurement, and Investment Management Can Be Further Improved" (GAO-04-49, January 12, 2004)

"Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity" (GAO-04-394G, March 1, 2004)

National Aeronautics and Space Administration

"Review of Organizational Structure and Management of Information Technology and Information Technology Security Services at NASA" (IG-05-013, March 30, 2005)

NASA's IT Investment Portfolios for BY 2007, as Reported to OMB

Each year, Federal agencies must report on their IT investments to OMB by submitting Exhibit 53, "Agency IT Investment Portfolio." The annual report should provide a full and accurate accounting of IT investments, as required by the Clinger-Cohen Act of 1996. The Exhibit 53 reporting format was developed jointly by OMB and the CIO Council[3] to provide the basic information needed to link internal planning, budgeting, acquisition, and management of IT resources.

NASA's OAIT portfolio includes investments in the following categories: (1) financial management, (2) electronic government, (3) OAIT, (4) enterprise architecture and planning, and (5) grants management. OMB requires that Federal agencies report information about each of those categories as a separate IT investment portfolio. The following table provides a summary of NASA's breakdown for reporting investment portfolios in Exhibit 53 for BY 2007.

Summary of NASA's IT Investment Portfolios for BY 2007, as Reported to OMB on Exhibit 53

	Investment Portfolios		Total Investment (in millions)
Part 1	Mission Area		
	Mission Area 1	Financial Management	$ 57.8
	Mission Area 2	Multi-Program/Project IT	705.8
	Mission Area 3	Program-Unique IT Investments	748.6
	Mission Area 99	Electronic Government	5.3
Part 2	Office Automation, IT Infrastructure, and Telecommunications (OAIT)		702.1
Part 3	Enterprise Architecture and Planning		2.3
Part 4	Grants Management		–
	Total NASA IT Investment BY 2007		**$ 2,221.9**

The scope of this review was limited to assessing NASA's IT CPIC process over the OAIT portfolio as reported to OMB. This review did not include assessing the adequacy of the capital planning process applicable to NASA's other IT portfolios as discussed in Enclosure 1.

[3] The CIO Council serves as the principal interagency forum for improving practices in the design, modernization, use, sharing, and performance of Federal Government agency information resources.

NASA's OAIT Common Portfolio Categories for Its BY 2007 IT Capital Planning Cycle

According to the GAO ITIM framework, organizations should establish common portfolio categories to be used across the organization when each IT board creates its portfolio of IT investments. The creation of these common categories aids in comparing similar investments across the organization.

For its BY 2007 IT capital planning cycle, NASA established the following common portfolio categories for OAIT:

I. Overarching Strategies/Cross-Cutting Services
- A. Enterprise Architecture
- B. Secure Computing Environment
- C. Software Engineering
- D. IT Asset Management

II. Service Areas
- A. Communications Services Area
  - (1) Wide Area Network (WAN)
  - (2) Local Area Network (LAN)
  - (3) Voice
  - (4) Video
- B. Computing Services Area
  - (1) Desktop Hardware and Software
    - a. Corporate Desktop Systems
    - b. Scientific and Engineering Workstations
    - c. Mission Specific Desktop Systems
  - (2) Application Services
  - (3) Data Center
- C. Electronic Work Environment
  - (1) Messaging and Collaboration
    - a. E-Presence
    - b. Extensible Markup Language (XML)
  - (2) Public Web Services

Management's Comments

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

Reply to Attn of: **Office of the Chief Information Officer**

AUG - 4 2006

TO: Office of Inspector General

FROM: NASA Chief Information Officer (Acting)

SUBJECT: Response to Draft Report A-05-020-00

Following are management comments on the subject draft audit report A-05-020-00, "NASA's Information Technology Capital Planning and Investment Control," with the purpose of identifying the actions that will be taken concerning the recommendations made by the OIG.

OIG Recommendations for Corrective Action:

1. **The Office of the Chief Information Office (OCIO) establish clear requirements mandating compliance with NASA's IT CPIC policy and use of common portfolio categories throughout the Agency.**

   OCIO Response:

   Concur: A revised NASA IT CPIC policy has been developed and is in use for common portfolio categories throughout the Agency. All Center CIO's must comply with the NASA CPIC policy.

2. **The OCIO review Center's IT CPIC submissions to ensure that Centers comply with established policy.**

   OCIO Response:

   Concur: The Center CPICs have been reviewed for compliance with the established policy. The review was completed June 2006.

3. **The OCIO ensure that all investments in the OAIT portfolio undergo the portfolio selection process as specified in the NASA IT CPIC policy during the next (BY2008) IT capital planning cycle.**

OCIO Response:

Concur: The OAIT portfolio did undergo a portfolio selection process. This process is on-going until all budgets are submitted to be incorporated into the President's Budget for FY 2008.

If you have any questions regarding this memorandum, please direct them to Bill Tufte at 202-358-2438 or bill.tufte@nasa.gov.

John W. McManus