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AUDIT REPORT

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NASA INFRASTRUCTURE AND FACILITIES:
ASSESSMENT OF DATA USED TO MANAGE
REAL PROPERTY ASSETS

OFFICE OF INSPECTOR GENERAL



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Space Administration

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Acronyms

FERP	Facilities Engineering and Real Property Division
GAO	Government Accountability Office
GSA	General Services Administration
NPR	NASA Procedural Requirements
NTC	NASA Technical Capabilities
OIG	Office of Inspector General
O&M	Operations and Maintenance
RPMS	Real Property Management System
SPF	Space Power Facility

OVERVIEW

NASA INFRASTRUCTURE AND FACILITIES: ASSESSMENT OF DATA USED TO MANAGE REAL PROPERTY ASSETS

The Issue

NASA's real property holdings include approximately 5,000 buildings and structures such as wind tunnels, laboratories, launch pads, and test stands. In total, the assets occupy 44 million square feet and represent more than \$26.4 billion in current replacement value.¹ However, 80 percent of NASA's facilities are 40 or more years old and many are in degraded condition. Moreover, NASA is dealing with the challenge of its aging infrastructure at a time of large and growing budget deficits that are straining the resources of all Federal agencies. As discretionary funding continues to decline, NASA will be required to make more prudent decisions regarding its infrastructure. In addition, the issue of the Agency's aging infrastructure has been identified by NASA, the Office of Inspector General (OIG), the Government Accountability Office (GAO), and Congress as a top challenge for nearly a decade.²

The NASA Authorization Act of 2010 directs NASA to examine its real property assets and, as appropriate, downsize to fit current and future missions and expected funding levels, "paying particular attention to identifying and removing unneeded or duplicative infrastructure."³ In order to make these types of strategic decisions, NASA needs a clear understanding of each asset's utilization, condition, and relationship to the Agency's mission.

NASA uses a variety of data sources to manage its facilities. However, only one data source – the Real Property Management System (RPMS) – is designed to capture key information such as utilization, mission dependency, and condition consistently across all NASA Centers. The Agency uses the information in the RPMS to complete required reports such as annual reports of Federal real property to the General Services Administration (GSA). In addition, NASA uses the RPMS to integrate real property data with its financial system.

¹ Information obtained from NASA's Deferred Maintenance Assessment Report, October 1, 2010.

² "NASA's Real Property Management Plan," November 2004; NASA OIG, "NASA's Top Management and Performance Challenges," November 2010; GAO, "High Risk Series: Federal Real Property: Progress Made Toward Addressing Problems, but Underlying Obstacles Continue to Hamper Reform" (GAO-07-349, April 2007); and Public Law 111-267, "NASA Authorization Act of 2010," October 11, 2010.

³ Public Law 111-267, "NASA Authorization Act of 2010," October 11, 2010.

Having accurate and consistent data on its real property assets is crucial to NASA's ability to manage its large and diverse assets as well as to maintain accountable and transparent Agency operations. Given the real property challenges facing the Agency and the importance of the RPMS to helping NASA meet these challenges, the OIG examined the accuracy of RPMS data.

In the RPMS, NASA tracks a variety of data elements related to its facilities including location, operating status, value, operations and maintenance costs, utilization, mission dependency, and condition. Because utilization, mission dependency, and condition are the primary factors driving NASA's decisions on whether to maintain, repair, consolidate, out-lease, sell, or demolish existing assets, we focused our review on these three data elements. To conduct our review, we obtained data from the RPMS for the period October 2009 through September 2010, and we conducted inspections of 34 facilities at three NASA Centers: Kennedy Space Center; Glenn Research Center and Glenn's Plum Brook Station; and Marshall Space Flight Center. See Appendix A for details of our scope and methodology. Appendix B provides additional details and photographs of some of the facilities we visited.

Results

We found that RPMS data relating to the three key elements of utilization, mission dependency, and condition to be unreliable metrics for evaluating NASA's real property assets, largely because the Centers use inadequate processes to gather and update the information. For example, the Centers we visited had inadequate processes in place to accurately track the use of their facilities. Instead, they simply designated facilities as "Utilized" in the RPMS if they were aware that the facility was occupied or a NASA program reported the facility as active. However, based on our inspections, 15 of the 34 facilities we visited were characterized as "Utilized" in the RPMS but actually were not in use, were no longer being used for the operations reported in the RPMS, or had been mothballed or demolished. For example, several of the test stands we inspected at Marshall were listed as "Utilized" in the RPMS even though they had not been used for more than 10 years.

In addition, we found a lack of guidance and use of a ratings scale that fails to make meaningful distinctions between facilities limited the usefulness of the data intended to track the mission dependency of NASA facilities. Specifically, officials at the Centers we visited had widely differing opinions about what constituted a "mission." For example, one official stated that he used the individual mission of the facility that he was rating, another official said he used the Center's mission, and a third official stated that she used NASA's overall missions. As a result, we found differences between the ratings applied to similar assets across the Centers. At the same time, the scale NASA uses to rate the criticality of facilities limits the Agency's ability to make meaningful distinctions between facilities. For example, at the Centers we visited 85 percent of the facilities were rated as "Mission Dependent" or "Mission Critical."

Finally, in tracking the physical condition of its facilities, NASA relies on only cursory visual inspections generally performed by small teams under tight deadlines. Given the cursory nature of the inspections, we question the accuracy of the information in the RPMS regarding the physical condition of NASA facilities. For example, we found that the condition data recorded in the RPMS for some of the facilities at Glenn’s Plum Brook Station failed to reflect their true conditions.

While the RPMS is not the only information source NASA uses to manage its real property, it is the Agency’s only centralized database designed to track key real property information consistently across all Centers. Without accurate and consistent Agency-wide facilities data, NASA managers do not have the information necessary to effectively manage the Agency’s real property inventory. This hinders their ability to make strategic decisions regarding NASA’s real property assets, especially decisions involving choices between Centers. Furthermore, accurately reporting the utilization, mission dependency, and condition of its facilities – many of which require substantial operations and maintenance costs – to GSA, Congress, and other parties is crucial to maintaining transparent and accountable Agency operations. In our judgment, additional guidance from Headquarters to the Centers would improve the reliability of RPMS data. Moreover, until such steps are taken, it is important that NASA managers understand the limitations of RPMS data, manage those limitations accordingly, and disclose those limitations when using the data to support reports to NASA management, Congress, or other parties.

Management Action

Given NASA’s ongoing real property challenges and the importance of having reliable Agency-wide data to address these challenges, we recommended that the Associate Administrator for the Mission Support Directorate take a series of actions to help improve the accuracy of RPMS data. Our recommendations included establishing processes that accurately capture the utilization rates of facilities in the RPMS; revising NASA policy to include guidance for conducting mission dependency reviews, including developing a consistent definition of mission; and ensuring contractors are provided sufficient detail and direction for conducting assessments of the physical condition of NASA’s facilities.

In response to a draft of this report, the Associate Administrator concurred with our recommendation to develop guidance for conducting mission dependency reviews and partially concurred with our recommendations to establish guidance and processes for capturing utilization rates and ensuring that contractors are provided with sufficient detail and direction for conducting facility condition assessments. He stated that while he planned to develop additional guidance in both areas, implementing those actions “may be constrained by limited resources – both people and funding.” The Associate Administrator also provided technical comments on the draft, and we made revisions to the report where appropriate.

We consider the Associate Administrator's comments to be responsive to our recommendations and will close the recommendations upon completion and verification of the proposed corrective actions. Establishment of further guidance and processes for Centers to better understand and accurately capture the utilization, mission dependency, and condition of NASA's facilities are positive steps that will provide greater insights when managing the Agency's real property holdings. While we recognize that implementing these actions may be difficult in a time of reduced resources, we believe that any costs associated with improving the data will ultimately lead to greater cost savings in the future by enabling the Agency to more effectively manage its real property holdings.

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INTRODUCTION

Background

NASA is the ninth largest Federal Government property holder, with real property holdings of more than 100,000 acres and approximately 5,000 buildings and other structures encompassing more than 44 million square feet. NASA's property holdings are located throughout the world and include commercial office buildings, warehouses, test stands, laboratories, wind tunnels, launch pads, antenna arrays, airfields, roads, and utilities. In total, the assets represent more than \$26.4 billion in current replacement value.⁴ However, 80 percent of NASA's facilities are 40 or more years old and many are in need of repair and refurbishment. At the same time, the Agency is undergoing considerable changes in mission focus, with the Space Shuttle Program ending after 39 years. Accordingly, NASA will have to make some difficult decisions to evolve toward the most efficient facility structure for its future. To address these challenges, NASA will require accurate and reliable data about its facilities.

The Agency's aging infrastructure has been identified by NASA, the Office of Inspector General (OIG), the Government Accountability Office (GAO), and Congress as a top challenge for the Agency for nearly a decade.⁵ In the NASA Authorization Act of 2010, Congress directed the Agency to complete an Institutional Requirements Study examining its assets and identifying a strategy for moving forward. The Study is due to Congress by October 2011.

NASA uses a variety of information sources to manage its facilities at both the Headquarters and Center levels. For example, the three Centers we visited – Kennedy Space Center, Marshall Space Flight Center, and Glenn Research Center – use databases to track the utilization of administrative office space for the purposes of managing and assigning office space to Center personnel. In addition, the Mission Support Directorate recently began development of the NASA Technical Capabilities (NTC) database to help track facility capabilities and workforce requirements.⁶ While these databases provide or are expected to provide useful information to help the Centers manage their real property, currently NASA has only one system designed to capture key real property

⁴ Information obtained from NASA's Deferred Maintenance Assessment Report, October 1, 2010.

⁵ "NASA's Real Property Management Plan," November 2004; NASA OIG, "NASA's Top Management and Performance Challenges," November 2010; GAO, "High Risk Series: Federal Real Property: Progress Made Toward Addressing Problems, but Underlying Obstacles Continue to Hamper Reform" (GAO-07-349, April 2007); and Public Law 111-267, "NASA Authorization Act of 2010," October 11, 2010.

⁶ The NTC database will only provide information on facilities that support certain technical capabilities, while the Real Property Management System (RPMS) provides key information on all NASA facilities. NASA officials expect NTC to be fully operable in 2012.

information including utilization, mission dependency, and condition consistently across all NASA Centers – the Real Property Management System (RPMS).

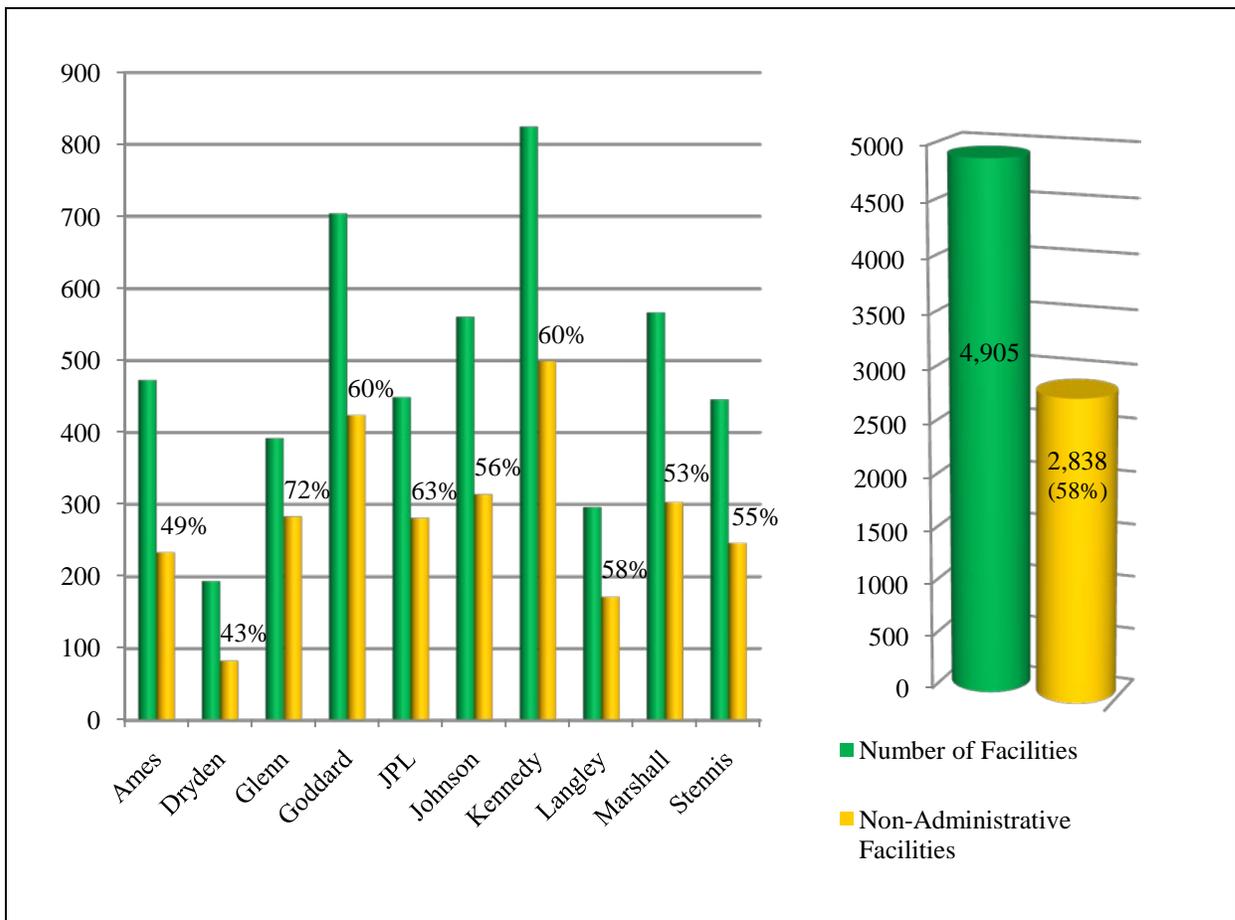
Real Property Management System. NASA established the RPMS in October 2010 to integrate the Agency’s disparate real property data systems with its financial systems.⁷ The RPMS is an Agency-wide electronic data system for compiling, analyzing, and reporting on real property assets. NASA maintains real property data in the RPMS for assets with an acquisition cost of at least \$5,000 that NASA owns, leases, or controls. The RPMS contains data elements on each asset, describing characteristics such as location, operating status, value, operations and maintenance (O&M) costs, utilization, mission dependency, and condition. The data also provides NASA decision makers with information regarding the size, type, sustainability, and efficiency of the Agency’s facilities. In addition, the Agency uses the database to fulfill Federal reporting requirements, such as the annual requirement to report Federal real property to the General Services Administration (GSA) for inclusion in the Federal Real Property Profile. NASA also uses the RPMS to integrate real property data with its financial system.

NASA captures key information on both administrative and non-administrative facilities in the RPMS. Administrative facilities generally comprise office space while non-administrative facilities include processing facilities, wind tunnels, test stands, laboratories, and warehouses.⁸ As shown in Figure 1, non-administrative facilities account for more than half of all NASA facilities. (Figure 1 also shows non-administrative facilities as a percentage of total facilities at each NASA Center.)

⁷ Prior to this integration, NASA maintained the Agency’s real property data in its Real Property Inventory system.

⁸ For our review, we categorized NASA’s facilities, including maintenance and production, operational, research development and testing, and supply, as “non-administrative facilities.”

Figure 1. NASA’s Non-Administrative Facilities as of September 2010



Essential Real Property Data Tracked within the RPMS. According to the *NASA Real Property Asset Management Plan*, NASA Centers, Mission Directorates, and the Facilities Engineering and Real Property Division (FERP) are to consider specific factors when determining whether to maintain, repair, consolidate, out-lease, sell, or demolish existing assets.⁹ These factors are measured and tracked in the RPMS and include (1) utilization rate, (2) mission dependency status, and (3) physical condition (see Figure 2). For example, NASA managers may consider demolishing an asset that is not “Mission Dependent” and no longer in good physical condition. Conversely, if the asset is “Not Mission Dependent” but is in good condition, NASA may consider its lease or sale. Because of their importance to decision makers, we focused our review on the accuracy of these data elements in the RPMS database. Following is a detailed explanation of each element.

⁹ The *NASA Real Property Asset Management Plan* serves as NASA’s guide for promoting the efficient and economical use of the Agency’s real property holdings in accordance with Executive Order 13327 and the Federal Real Property Council.

better manage risks to programs and guide investment and divestiture decisions. NASA Centers are required to assess and update mission dependency scores for all assets every 3 years. Asset assessments are based on the responses to two questions related to the asset's impact on mission:

- How long could the functions supported by your infrastructure be stopped without adverse impact to the mission?
- If your facility was not functional, could you continue performing your mission by using another facility or by setting up temporary facilities?

Each asset is given a mission dependency score on a scale of 1 to 100. Assets with mission dependency scores of 71 to 100 are considered "Mission Critical," 10 to 70 are "Mission Dependent," and 0 to 9 are "Not Mission Dependent." "Mission Critical" assets are those assets that would compromise the Agency's mission if unavailable. Assets that are "Not Mission Dependent" would have no effect on the Agency's mission if unavailable. "Mission Dependent" assets are those assets that are neither "Mission Critical" nor "Not Mission Dependent."

Condition Data. Condition data provide information on the physical condition of the Agency's real property assets at a specific point in time. To measure the condition of each asset, NASA hires contractors to perform annual condition assessment surveys of all facilities. For each asset, the contractor rates nine major systems: structure; exterior; roof; heating, ventilation, and air conditioning; electrical; plumbing; conveyance systems (e.g., elevators); interior; and equipment. NASA calculates a condition index score using a five-point scale for each asset using the contractor-provided ratings. According to the *NASA Real Property Asset Management Plan*, assets rated as a five are newer facilities with little or no repairs needed, assets rated lower than three are considered in poor condition, and any asset rated as a one should be condemned.

Facilities Engineering and Real Property Division. FERP, a division of the Mission Support Directorate's Office of Strategic Infrastructure, serves as the principal point of contact for NASA's real property activities and policy. NASA Centers control the majority of the Agency's real property and are responsible for managing their assets with guidance and oversight from FERP. NASA Centers' Real Property Accountable Officers upload, maintain, and establish controls to ensure the accuracy of RPMS data for their respective Centers. Major asset management decisions are vetted through the Agency's Operations Management Council that serves as NASA's senior decision-making body for reviewing and approving capital investments.

Objectives

Our objective was to determine the accuracy of the information in the RPMS regarding facility utilization, mission dependency, and condition. We also reviewed internal controls as they relate to the overall objective. See Appendix A for details of the audit's scope and methodology, our review of internal controls, and a list of prior coverage. See Appendix B for additional details and photographs of some of the facilities we inspected.

KEY DATA IN NASA'S REAL PROPERTY MANAGEMENT SYSTEM IS UNRELIABLE

We found that RPMS data relating to the three key elements of utilization, mission dependency, and condition to be unreliable metrics for evaluating NASA's real property assets, largely because the Centers use inadequate processes to gather and update the information. Specifically, the Centers did not accurately record utilization data in the RPMS; mission dependency data lacked uniformity across Centers because of insufficient guidance about how to define "mission"; the Agency's method for scoring mission dependency fails to prioritize among facilities; and condition ratings of the Agency's facilities were based on cursory inspections, raising concerns about their accuracy. Without accurate facilities data, NASA managers do not have reliable information to manage the Agency's real property inventory, which hinders their ability to make objective Agency-wide decisions regarding NASA's real property assets.

Utilization of Facilities Not Accurately Recorded in the RPMS

The three Centers we visited had inadequate processes in place to record accurately the utilization rates of their facilities in the RPMS and instead designated facilities as "Utilized" in the database regardless of their actual usage level.¹² As a result, the utilization data did not reflect actual conditions for 15 of the 34 facilities we inspected. Although characterized as "Utilized" in the database, these 15 facilities were not in use, no longer performed the operations reported in the RPMS, or had been mothballed or demolished.¹³ For example, Plum Brook's Heat Transfer Facility Test Building (Figure 3) was identified in the RPMS as "Utilized" even though it had been placed in mothball status in 2008.

¹² We inspected 34 non-administrative facilities at three NASA Centers: 10 at Kennedy Space Center in Florida; 8 at Glenn Research Center in Cleveland, Ohio; 5 at Glenn's Plum Brook Station in Sandusky, Ohio; and 11 at Marshall Space Flight Center in Huntsville, Alabama. NASA guidance requires that facility usage rates exceed 50 percent to be considered "Utilized."

¹³ Mothballed facilities are facilities that have been taken out of use with appropriate maintenance measures to prevent deterioration of essential systems.

Figure 3. Heat Transfer Facility Test Building at Plum Brook



Source: Glenn’s Plum Brook Station Intranet Building List

Figure 4. Advanced Engine Test Facility at Marshall



Source: Marshall’s Facilities Geographical Information System

Similarly, several of the test stands we inspected at Marshall were listed as “Utilized” in the RPMS even though they had not been used for more than 10 years (Figure 4 shows one of the test stands we inspected). In addition, a test facility at Glenn was listed as “Utilized,” but we found that it was not currently in use and in fact had not performed the operations reported in the RPMS for more than 10 years. In another example, a warehouse at Plum Brook listed as “Utilized” had been demolished. (See Table 1 for the results of our review, and Appendix B for other photographs and additional details of these facilities.)

Table 1. Kennedy, Glenn, and Marshall Utilization Rates Not Accurately Characterized in RPMS							
Center	Facility	Description	Square Feet	Value	O&M Costs*	RPMS Rate	OIG Assessment
Kennedy	Boresight Control Building	Communications test facility	1,200	\$ 1,489,985	\$ 44,080	Utilized	Not Utilized
Kennedy	PHSF	Hazardous payload processing facility	18,813	19,885,907	419,517	Utilized	Not Utilized
Kennedy	RTG	Nuclear Processing Facility	3,788	1,847,669	51,843	Utilized	Not Utilized

* O&M costs refer to those costs that NASA incurs on an annual basis to operate and maintain a particular facility.

Table 1. Utilization Rates Not Accurately Characterized in RPMS (continued)							
Center	Facility	Description	Square Feet	Value	O&M Costs*	RPMS Rate	OIG Assessment
Glenn	B Control and Data Building	Control center	11,508	\$ 4,919,098	\$ 33,426	Utilized	Not Utilized
Glenn	HTF Test Building	Propulsion systems testing	6,082	38,464,125	31,851	Utilized	Not Utilized
Glenn	PSL Engine Test Building	Propulsion systems testing	45,192	45,697,087	264,676	Utilized	Not Utilized
Glenn	Research Combustion Lab	Small propulsion systems testing	17,092	9,877,158	132,850	Utilized	Not Utilized
Glenn	SPF Test Building	Space simulation testing	139,358	187,195,405	1,918,589	Utilized	Not Utilized
Glenn	Vertical Lift Engine Test Facility	Fuel cell testing	N/A	3,014,580	1,286	Utilized	Different Function
Glenn	Warehouse (9205)	Storage	10,950	1,483,582	0	Utilized	Demolished
Marshall	Advanced Engine Test Facility	Test stand	N/A	120,497,537	273,439	Utilized	Not Utilized
Marshall	Propulsion & Structural Test Facility	Test stand	N/A	32,707,706	167,905	Utilized	Not Utilized
Marshall	Structural Dynamic Test Facility	Test stand	N/A	60,812,961	118,596	Utilized	Not Utilized
Marshall	Test Facility 300	Test stand	N/A	8,617,134	51,099	Utilized	Not Utilized
Marshall	Test Facility 500	Test stand	N/A	12,092,502	35,763	Utilized	Not Utilized

* O&M costs refer to those costs that NASA incurs on an annual basis to operate and maintain a particular facility.

In our judgment, the problems with the utilization data in the RPMS were the result of inadequate processes used by the Centers to track the data in accordance with NASA policy. Specifically, Real Property officials from the three Centers we visited told us that they did not have processes in place to calculate usage rates or conduct annual inspections to ensure data accuracy.¹⁴ Rather, they simply designated facilities as “Utilized” if they were aware that the facilities were occupied or a NASA program reported the facilities as active. However, according to NASA policy, Centers should perform annual utilization reviews of all real property under their cognizance.¹⁵ During these reviews, Center officials are supposed to identify a usage rate based on either the

¹⁴ The three Centers we visited – Kennedy, Marshall, and Glenn – used Center-level databases to track the utilization of administrative office space for the purposes of managing and assigning office space to Center personnel. While these systems enabled the Centers to track utilization data on their administrative facilities, this data was not used to calculate utilization rates in the RPMS.

¹⁵ NPR 8800.15B, “Real Estate Management Program,” June 21, 2010.

percentage of space in use compared with the total space available, or based on the number of days the facility is available compared with the number of days it is used. Based on a comparison of each facility's usage percentage with Federal thresholds, Center officials should report a corresponding utilization rate in the RPMS. To be considered "Utilized," a facility's usage rate must exceed 50 percent.¹⁶

FERP officials contend that the utilization criteria as outlined in NASA policy is not intended to define utilization rates for every type of facility. They argue that determining utilization rates for non-administrative facilities based on annual usage as outlined in current NASA policy is problematic because the data do not account for the likelihood of future use.¹⁷ As such, they consider non-administrative facilities with critical capabilities as "Utilized" even if they are only in use for minimal portions of a year. We acknowledge that many of NASA's non-administrative facilities have highly specialized capabilities that would be expensive to replace and agree that the Agency should consider the likelihood of future use as well as replacement cost in making decisions regarding non-administrative facilities. Nevertheless, in our judgment accurately tracking and reporting annual utilization rates is a fundamental aspect of real property management and transparent Government operations. Without this information, NASA is missing key data necessary to inform its property management decisions.

Without accurate utilization data, NASA is unable to accurately assess the costs associated with maintaining under- or non-utilized facilities. During our review, we found 15 facilities with annual O&M costs of approximately \$3.5 million that NASA was not fully utilizing. For example, the Space Power Facility (SPF) Test Building at Plum Brook Station (Figure 5), which has the capability to simulate the space environment, is reported in the RPMS as "Utilized." However, the facility – which requires nearly \$2 million in annual O&M costs – has not been used since 2009. Similarly, several test stands at Marshall that require between \$35,763 and \$273,439 in annual O&M costs but have not been used by NASA for more than 10 years are reported in the RPMS as "Utilized."

¹⁶ NASA also uses the data element "Facility Status" to track utilization in the RPMS. Specifically, NPR 8800.15B states that the space utilization of an "Active" facility is normally at least 50 percent or the usage level exceeds 50 percent of the number of days that it is available. An active facility is a facility that is being used by a current or future program or has an institutional requirement. We reviewed facilities designated as "Active" for our audit. Our review found that in the cases where facilities were inaccurately rated as "Utilized" in the RPMS, they were also inaccurately designated as "Active." As such, we do not make a distinction between "Active" and "Utilized" in the report.

¹⁷ For our review, we categorized NASA's facilities, including maintenance and production, operational, research development and testing, and supply, as "non-administrative facilities."

Figure 5. SPF Test Building



Source: Glenn’s Plum Brook Station Intranet Building List

Lack of Guidance and Imprecise Rating Scale Limit the Usefulness of Mission Dependency Data

Mission dependency data are designed to identify the relative importance of facilities in terms of their role in accomplishing the Agency’s mission. However, at the three Centers we visited we found weaknesses in the methods used to determine mission dependency that limit the usefulness of the data. First, we found no uniformity in the definition of “mission” among the Centers when interpreting a facility’s mission dependency score. For example, one official stated that he used the individual mission of the facility that he was rating, another official stated that he used the Center’s mission, while a third official stated that she based her assessment on NASA’s overall missions. As a result, we found differences between the ratings applied to similar assets across the three Centers. For example, on a scale of 1 to 100, a Child Development Center at Kennedy was rated a 24, 25 at Marshall, and 48 at Glenn.¹⁸

Center officials said that NASA’s FERP did not provide sufficient guidance on how Centers should measure and define mission when measuring mission dependency. Center officials explained that FERP provided only limited guidance, and consequently the officials responsible for conducting the reviews developed varying interpretations of what constituted a mission. FERP officials acknowledged the problem and said that they also found inconsistent mission dependency data across the Agency as a result of the varying interpretations of the term “mission.” FERP officials explained that they were currently

¹⁸ Assets with mission dependency scores of 71 to 100 are considered “Mission Critical,” 10 to 70 are “Mission Dependent,” and 0 to 9 are “Not Mission Dependent.”

refining the definition of mission so that it better aligns with NASA's strategic missions and programs. In addition, they agree that additional guidance to the Centers would improve the consistency of RPMS data.

A second weakness of RPMS mission dependency data is that the scale NASA uses to rate the criticality of facilities is imprecise and limits meaningful prioritization among facilities. NASA's scale considers facilities with mission dependency ratings of 71 to 100 as "Mission Critical" and 10 to 70 as "Mission Dependent." Only those facilities rated from 0 to 9 are considered "Not Mission Dependent." Overall, at the three Centers we visited, 15 percent of the facilities received a 0–9 rating and therefore are characterized as "Not Mission Dependent." We found that under NASA's rating system, even facilities with relatively low ratings are designated as "Mission Dependent" in the RPMS. FERP officials said that an independent assessment conducted by the Navy in 2006 noted that the scale to assess a facility as "Not Mission Dependent" should more appropriately range from 0 to 20.¹⁹ Using this scale, 23 percent, or an additional 153 facilities at the three Centers we visited, would be considered "Not Mission Dependent." This included a variety of facilities including test facilities, laboratories, and warehouses.

While many NASA facilities clearly are important to the Agency's mission, scoring more than 85 percent as "Mission Dependent" or "Mission Critical" devalues the data element as a tool to evaluate the extent to which NASA's facilities within and across Centers are linked to specific NASA missions. Furthermore, by using a rating system with such a broad range, NASA is furthering the perception that the Agency is dependent on nearly all of its facilities and would suffer adverse impacts to its overall mission if the facilities were unavailable. Given the shortcomings in the current rating system, it is difficult to assess which of NASA's facilities across the Agency are truly "Mission Dependent." This in turn hampers NASA's ability to make appropriate strategic decisions regarding the disposition of its real property assets.

Accuracy of Facility Condition Ratings Questionable Due to Cursory Inspections

NASA relies on cursory inspections to assess the physical condition of its facilities. According to NASA's Deferred Maintenance Assessment Report, the condition of a facility should be based on inspections of nine components such as structural integrity and heating and electrical systems.²⁰ However, the assessments generally consist of cursory visual inspections performed by a few people over a very brief period. For example, to determine the condition ratings of Kennedy's 1,154 facilities for fiscal year 2010, a contractor employed five personnel for 2 weeks to perform all the inspections.²¹

¹⁹ The Navy, Coast Guard, and NASA collaborated to develop the Mission Dependency Index in 2001.

²⁰ For each asset, the contractor rates the asset's structure, exterior, roof, heating ventilation and air conditioning, electric, plumbing, conveyance systems (e.g., elevators), interior, and equipment.

²¹ To assess Glenn and Plum Brook's 405 facilities, a contractor employed four personnel for 5 days. At Marshall, a contractor employed four personnel for 20 hours total to assess 284 facilities.

In addition, according to Center officials, some of the assessments were limited to drive-by visual inspections. Given the cursory nature of the inspections, we question the accuracy of the condition data recorded in the RPMS. Inaccurate condition data limits NASA's ability to make appropriate decisions on whether to keep and maintain particular facilities.

As one example, we found that the condition data recorded in the RPMS for some of the facilities at Glenn's Plum Brook Station failed to reflect their true condition. Some facilities showed excessive wear and tear that would require significant repairs, yet NASA rated them in the RPMS as being in "Fair" to "Good" condition. Specifically, NASA rated the condition of a warehouse at Plum Brook as "Fair" even though the facility is 67 years old and had clear signs of structural degradation including portions of the roof caving in (see Figure 6).²² We also noted several other warehouses at Plum Brook that were in similarly deteriorating condition, yet were rated as being in "Good" condition in the RPMS. For example, the 99 Igloos – World War II ammunition depots converted by Plum Brook into storage facilities – were all rated as a four on the five-point condition index scale indicating that they are in "Good" condition. However, the structures are 68 years old and most are in degraded condition (see Figure 7). According to the facility manager, most have also experienced problems with moisture and rodent infestations.

Figure 6. Warehouse at Plum Brook Station Rated in "Fair" Condition



Source: NASA OIG photograph (March 2011)

²² Following our review, Glenn officials scheduled the warehouse for demolish in FY 2014.

Figure 7. Igloos at Plum Brook Station Rated in “Good” Condition



Source: Glenn photographs (July 2010)

Conclusion

Given the extent and age of NASA’s facilities, and particularly in this time of large and growing national budget deficits, it is imperative that NASA managers have reliable data with which to manage the Agency’s real property assets. The RPMS is currently the only database designed to capture real property information across the entire Agency. Without accurate and consistent Agency-wide facilities data, NASA managers are hindered in their ability to make strategic decisions regarding NASA’s real property assets, especially decisions involving trade-offs between facilities at different Centers. In addition, accurately reporting the utilization, mission dependency, and condition of its facilities – many of which require substantial O&M costs – to GSA, Congress, and other parties is crucial to maintaining transparent and accountable Agency operations. For these reasons, we encourage NASA to improve the accuracy of its real property data. In our judgment, additional guidance from FERP to the Centers would help improve the reliability of the data.

Until steps are taken to improve the accuracy of the data, it is important that NASA managers understand, manage, and disclose the limitations of the RPMS database when using the data to support reports to Congress and the public.

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

Given NASA's ongoing real property challenges and the importance of having reliable Agency-wide data to address these challenges, we recommended that the Associate Administrator for the Mission Support Directorate direct the Facilities Engineering and Real Property Division to take the following actions to help improve the accuracy of RPMS data.

Recommendation 1. Establish processes for the Centers that accurately capture the utilization rates of facilities in the RPMS. These processes should include, at a minimum, the use of quantitative methods to calculate utilization rates and annual inspections of facilities.

Management's Response. The Associate Administrator for the Mission Support Directorate partially concurred with our recommendation, stating that he will establish further guidance and processes for Centers to better understand utilization and accurately capture the utilization rates of NASA's facilities. However, he stated that the implementation of any new processes "may be problematic due to limited resources – both people and funding." In addition, he stated that the utilization of highly technical facilities, such as test stands and wind tunnels, is difficult to capture because of the intermittent use and requirements by programs and missions. Nonetheless, he noted that NASA is currently awaiting guidance from the Office of Management and Budget and GSA, as well as reviewing other metrics, for better determining the utilization of technical facilities.

Evaluation of Management's Response. We consider management's comments responsive and will close the recommendation upon completion and verification of the proposed corrective actions. In our judgment, development of further guidance for the Centers is a positive step toward improving the accuracy of utilization data. While we recognize that implementing new processes may be difficult because of reduced resources, the costs of developing further guidance should be minor. In addition, we believe that any costs associated with improving the data will ultimately lead to greater cost savings in the future by enabling the Agency to more effectively manage its real property holdings.

Recommendation 2. Revise NASA policy to include guidance for conducting mission dependency reviews, including developing a consistent definition of the mission reviewers should consider when performing the reviews.

Management's Response. The Associate Administrator concurred, stating that he will revise NASA policy to include guidance for conducting mission dependency reviews.

Evaluation of Management's Response. Management's proposed actions are responsive; therefore, the recommendation is resolved and will be closed upon verification and completion of the proposed corrective actions.

Recommendation 3. Reassess and revise, as appropriate, contracts for condition assessments to provide contractors sufficient detail and direction to ensure that the Agency is provided comprehensive assessments of the physical condition of its facilities.

Management's Response. The Associate Administrator partially concurred with our recommendation, stating that he will reassess and revise, as appropriate, contracts for condition assessments. However, he stated that implementing additional contract requirements will be difficult due to ongoing cuts to NASA's budget. He also noted that although errors were found in the data relating to the contractors' assessments of the condition of Agency assets, these assessments are the most cost-effective method of providing NASA with the most relevant information without incurring excessive contract costs.

Evaluation of Management's Response. We consider management's comments responsive and will close the recommendation upon completion and verification of the proposed corrective actions. In our judgment, reassessing and revising the contracts for condition assessments are positive steps toward improving the quality of condition data. While we recognize that implementing these actions may be difficult due to reduced resources, we believe that any costs associated with improving the data will ultimately lead to greater cost savings in the future by enabling the Agency to more effectively manage its real property holdings.

Scope and Methodology

We performed this audit from October 2010 through July 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Our announced objectives included determining whether NASA's real property assets were supported by verifiable program and mission requirements. However, we did not pursue that objective because of the relevance of our findings concerning RPMS data.

We reviewed Federal, NASA, and Center policies and regulations to determine the requirements and criteria for assessing real property assets' utilization, mission dependency, and condition. The documents we reviewed included Executive Order 13327, February 6, 2004; "Federal Real Property Asset Management," March 2007; the Federal Real Property Council's "2010 Guidance for Real Property Inventory Reporting," October 25, 2010; NPR 8800.15B, "Real Estate Management Program," June 21, 2010; NASA Policy Directive 8800.14D, "Policy for Real Estate Management (Revalidated, October 14, 2009)"; and various Center regulations and plans, such as Kennedy NPR 8830.1, "Facilities Asset Management Procedural Requirements," March 28, 2011, and "NASA's Real Property Management Plan," November 2004.

We also interviewed FERP and Center officials to determine how data contained in the RPMS on utilization, mission dependency, and condition were assessed, reported, and verified. We judgmentally selected facilities at Kennedy, Glenn, and Marshall for detailed review. We chose those three Centers because each Center represented one of NASA's primary mission themes: Science and Aeronautics, Space Operations, and Mission Support. We performed limited validation testing for utilization and mission dependency data elements recorded for the facilities we reviewed. Our validation testing for RPMS utilization rates included visually inspecting facilities, reviewing facility logs, and discussions with facility managers. To validate mission dependency data, we reviewed the RPMS for anomalies in mission criticality ratings and held discussions with each Center's mission dependency expert. To assess the validity of RPMS condition data, we conducted visual inspections of facilities' external structure.

Computer-Processed Data

This report provides our assessment of the data contained in the RPMS, a NASA Enterprise System maintained in SAP. We obtained data for the period October 2009 through September 2010 from the RPMS, and we focused on the utilization, mission dependency, and condition data elements. As discussed in this report, we found that the data was not reliable. Although the number of facilities at the three Centers we visited also came from the RPMS, the accuracy of that data would not affect our findings or conclusions.

Review of Internal Controls

We reviewed and evaluated the internal controls associated with collecting and reporting data for inclusion in the RPMS. As discussed in this report, the policies and procedures governing data collection and reporting were not sufficient to ensure the reliability and validity of that data. Our recommendations, if implemented, should correct the identified weaknesses.

Prior Coverage

During the last 5 years, the NASA OIG, the GAO, and the National Research Council have issued three reports of particular relevance to the subject of this report. Unrestricted reports can be accessed over the Internet at <http://oig.nasa.gov/audits/reports/FY11> (NASA OIG), <http://www.gao.gov> (GAO), and <http://www.nap.edu/> (National Research Council).

NASA Office of Inspector General

“Audit of NASA’s Facilities Maintenance” (IG-11-015, March 2, 2011)

Government Accountability Office

“Federal Real Property: An Update on High Risk Issues” (GAO-09-801T, July 15, 2009)

National Research Council

“Capabilities for the Future: An Assessment of NASA Laboratories for Basic Research” (2010)

RESULTS OF FACILITY INSPECTIONS

For our review, we inspected 34 non-administrative facilities at three NASA Centers: Kennedy Space Center in Florida; Glenn Research Center in Cleveland and Glenn’s Plum Brook Station in Sandusky, Ohio; and Marshall Space Flight Center in Huntsville, Alabama. During these inspections, we found 15 facilities that NASA had inaccurately characterized as “Utilized” in the RPMS. Despite being characterized as “Utilized” in the database, the facilities were not in use, no longer performed the same operations, had been mothballed, or had been demolished. NASA guidance requires facility usage rates to exceed 50 percent for the facility to be considered “Utilized.” Below we describe each facility and assess its use.

Figure B-1. Payload Hazardous Services Facility (PHSF)



Center:	Kennedy Space Center, Florida
Date Built:	1986
Description:	The PHSF is a payload processing facility used to process both hazardous and nonhazardous payloads.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed the PHSF as “Utilized” in the RPMS for the 2010 reporting period. However, we determined that NASA did not use the facility in 2010. Rather, it was used last in July 2009 to process parts for the Hubble Space Telescope Servicing Mission. NASA plans to use the facility to process the Mars Science Laboratory in 2011.

Figure B-2. Radioisotopes Thermoelectric Generator (RTG)

Center Location:	Kennedy Space Center, Florida
Date Built:	1964
Description:	The RTG is a processing facility for loading radioisotopes used to power deep space missions.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed the RTG as “Utilized” in the RPMS for 2010. However, we determined that NASA did not use the facility in 2010, and its last significant use was to process the New Horizons spacecraft in 2005. NASA plans to use the facility to process the Mars Science Laboratory in 2011.

Figure B-3. Boresight Control Building



Center Location:	Kennedy Space Center, Florida
Date Built:	1964
Description:	The Boresight Control Building is a telemetry, tracking, and command support facility for testing the Space Shuttle's antennas.
RPMS Utilization Rate:	"Utilized"
NASA OIG Assessment:	NASA listed the Boresight Control Building as "Utilized" in the RPMS for 2010. However, we determined that NASA did not use the facility in 2010, and its last significant use was not known. NASA did not have any planned future uses.

Figure B-4. B Control and Data Building

Center Location:	Plum Brook Station, OH
Date Built:	1960
Description:	The B Control and Data Building is the control and data collection center for NASA's B-2 Spacecraft Propulsion Research Facility, which tests full-scale upper-stage vehicles and rocket engines under simulated high-altitude conditions.
RPMS Utilization Rate:	"Utilized"
NASA OIG Assessment:	NASA listed the B Control and Data building as "Utilized" in the RPMS for 2010. Although the facility is currently undergoing modifications, we determined that NASA did not use the facility in 2010, and it was last used to test tracer packages for a university between 2005 and 2006. NASA plans to use the facility for future J2X engine tests.

Figure B-5. Heat Transfer Facility (HTF) Test Building



Center Location:	Plum Brook Station, OH
Date Built:	1967
Description:	The HTF tests large-scale propulsion systems at hypersonic conditions.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed HTF as “Utilized” in the RPMS for 2010. However, we determined that NASA mothballed the facility 3 years ago, and its last significant use was in 2002. NASA did not have any planned future uses.

Figure B-6. Propulsion Systems Laboratory (PSL) Engine Test Building

Center Location:	Glenn Research Center, Ohio
Date Built:	1969
Description:	The PSL Engine Test Building is a full-scale engine test facility that can simulate flight conditions.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed PSL as “Utilized” in the RPMS for 2010. Although a portion of the facility was undergoing modifications, we determined that NASA only used the facility for testing 23 percent of the time in 2010. NASA expects the utilization rate to increase following the modifications.

Figure B-7. Research Combustion Laboratory



Center Location:	Glenn Research Center, Ohio
Date Built:	1945
Description:	The Research Combustion Lab consists of a suite of test cells to test advanced propulsion systems, propellant, and ignition systems.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed the Research Combustion Lab as “Utilized” in the RPMS for 2010. However, we determined that NASA only used the facility for testing 17 percent of the time in 2010. NASA did not have any planned future uses.

Figure B-8. Space Power Facility (SPF) Test Building

Center Location:	Plum Brook Station, Ohio
Date Built:	1968
Description:	The SPF Test Building is the world's largest space environmental simulation chamber and had the capability to test large spacecraft in a thermal vacuum environment.
RPMS Utilization Rate:	"Utilized"
NASA OIG Assessment:	NASA listed the SPF as "Utilized" in the RPMS for 2010. Although the facility is currently undergoing modifications to add additional capabilities, we determined that NASA did not use the facility in 2010, and it was last used sometime in 2009. NASA plans to use the facility for future Crew Exploration Vehicle tests.

Figure B-9. Vertical Lift Engine Test Facility



Center Location:	Glenn Research Center, Ohio
Date Built:	1973
Description:	Even though it is still known as the Vertical Lift Engine Test Facility, it is no longer used for that purpose and instead had been used by Glenn during some part of the past 10 years to conduct fuel cell tests.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed The Vertical Lift Engine Test Facility as “Utilized” in the RPMS for 2010. However, we determined that NASA no longer used the facility for vertical lift engine testing, and it was not used for any other purpose in 2010. NASA plans to use the facility for a short-term test in 2011 and then demolish it sometime in 2013.

Figure B-10. General Warehouse (Demolished) Site

Center Location:	Plum Brook Station, Ohio
Date Built:	1943
Description:	General warehouse
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed this general warehouse at Plum Brook as “Utilized” in the RPMS for 2010. However, we determined that the facility was demolished sometime in 2010.

Figure B-11. Advanced Engine Test Facility



Center Location:	Marshall Space Flight Center, Alabama
Date Built:	1965
Description:	The Advanced Engine Test Facility was built to test the first stage of the Saturn V rocket.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed the Advanced Engine Test Facility as “Utilized” in the RPMS for 2010. However, we determined that NASA did not use the facility in 2010, and in fact was last used to test a Russian-built rocket engine in 1998. NASA plans to mothball the facility some time in 2011 or 2012.

Figure B-12. Propulsion and Structural Test Facility

Center Location:	Marshall Space Flight Center, Alabama
Date Built:	1957
Description:	The Propulsion and Structural Test Facility was built to test Saturn I rockets.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed the Propulsion and Structural Test Facility as “Utilized” in the RPMS for 2010. However, we determined that NASA did not use the facility in 2010, and it was last used in the 1990s for testing Space Shuttle Solid Rocket Boosters. NASA plans to mothball the facility some time in 2011 or 2012.

Figure B-13. Structural Dynamic Test Facility



Center Location:	Marshall Space Flight Center, Alabama
Date Built:	1964
Description:	The Structural Dynamic Test Facility was built for ground vibration testing of the Saturn V rocket and the Apollo Spacecraft.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed the Structural Dynamic Test Facility as “Utilized” in the RPMS for 2010. However, we determined that NASA did not use the facility in 2010, and in fact was last used in the 1970s for ground vibration testing of the complete Space Shuttle vehicle. NASA plans to mothball the facility some time in 2011 or 2012.

Figure B-14. Test Facility 300

Center Location:	Marshall Space Flight Center, Alabama
Date Built:	1964
Description:	Test Facility 300 is a propulsion thermal dynamic test system for testing space propulsion systems.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed Test Facility 300 as “Utilized” in the RPMS for 2010. However, we determined that NASA did not use the facility in 2010, and it was last used in 2009 to test eco-sensors and foam for the Space Shuttle’s external tank. NASA plans to mothball the facility some time in 2011 or 2012.

Figure B-15. Test Facility 500



Center Location:	Marshall Space Flight Center, Alabama
Date Built:	1966
Description:	Test Facility 500 was constructed to test liquid hydrogen/liquid oxygen turbo pumps for the J-2 engine.
RPMS Utilization Rate:	“Utilized”
NASA OIG Assessment:	NASA listed Test Facility 500 as “Utilized” in the RPMS for 2010. However, we determined that NASA only used the facility for a short period in 2010 to perform cryogenic testing. NASA plans to mothball the facility some time in 2011 or 2012.

MANAGEMENT COMMENTS

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



AUG - 3 2011

Reply to Attn of:

Mission Support Directorate

TO: Assistant Inspector General for Audits

FROM: Associate Administrator for Mission Support

SUBJECT: OIG Draft Report: "NASA Infrastructure and Facilities: Assessment of Data Used to Manage Real Property Assets" (Assignment No. A-11-001-00)

The Mission Support Directorate (MSD) appreciates the opportunity to review and provide comments on the OIG draft report entitled, "NASA Infrastructure and Facilities: Assessment of Data Used to Manage Real Property Assets" (Assignment No. A-11-001-00) dated July 8, 2011. In the draft report, the Office of Inspector General (OIG) makes three recommendations directed to MSD. NASA's response to the OIG's recommendation, including projected completion dates, are as follows:

Recommendation 1: Establish processes for the Centers that accurately capture the utilization rates of facilities in the RPMS. These processes should include, at a minimum, the use of quantitative methods to calculate utilization rates and annual inspections of facilities.

Management's Response: Partially Concur. The Office of Strategic Infrastructure (OSI) will review its existing policies and processes to establish further guidance for Centers to better understand and accurately capture the utilization rates of NASA facilities. Implementation of any new processes established may be constrained by limited resources--both people and funding.

While utilization metrics for buildings are more straightforward and easier to define, utilization of highly technical facilities, such as test stands and wind tunnels, is difficult to capture because of the intermittent use and requirements by programs and missions. Other agencies having similar technical capabilities have also identified this problem with utilization. The Office of Management and Budget (OMB) and the General Services Administration (GSA) are currently engaged in discussions about how to better capture utilization for technical facilities. They are in the process of revising guidance for agency Federal Real Property Profile (FRPP) data calls. With the current and expected future budget limitations, NASA is reviewing various metrics for determining the utilization of our technical capabilities.

Planned Corrective Action Date: December 31, 2011

Recommendation 2: Revise NASA policy to include guidance for conducting mission dependency reviews, including development of a consistent definition of the mission that reviewers should consider when performing the reviews.

Management's Response: Concur. OSI will revise NASA policy to include guidance for conducting mission dependency reviews, including development of a consistent definition of the mission that reviewers should consider when performing reviews.

Guidelines for determining mission dependency are not provided within NASA Procedural Requirements 8800, Real Estate Management Program, but should be included. We have only recently focused on using mission dependency as a metric to identify potential asset disposition within the Agency.

Like utilization, mission dependency for technical facilities is not easily defined due to evolving requirements of programs and missions and unique facilities that are used intermittently. Mission dependency can vary at any given time, based on the Center's mission requirements. The key is to ensure that Centers understand our requirements and revalidate the mission dependency designation on a frequent basis. We will implement guidance and the requirement for Centers to ensure that this information is updated at a predetermined frequency.

Planned Corrective Action Date: December 31, 2011

Recommendation 3: Reassess and revise, as appropriate, contracts for condition assessments to provide contractors sufficient detail and direction to ensure that the Agency is provided comprehensive assessments of the physical condition of its facilities.

Management's Response: Partially Concur. MSD concurs with the recommendation to reassess and revise, as appropriate, contracts for condition assessments to provide contractors sufficient detail and direction to ensure that the Agency is provided comprehensive assessments of the physical condition of its facilities. However, ongoing constraints in NASA's Agency Management and Operations (AMO) budget and Center Management and Operations (CMAO) budgets will significantly impact any effort to implement additional contract requirements for information technology changes or verification auditing.

Although errors were found in the data relating to conditions of assets, we feel the assessment conducted by contractors is the most cost-effective method, within available budgetary and personnel resources, to provide NASA with the most relevant information without excessive contract costs. NASA uses a parametric method for estimating deferred maintenance. The process looks at up to nine systems for each type of building, and the systems are weighted as a percentage of critical replacement value based on the type of building or structure. This is a rapid visual assessment in which each building system is rated on a scale of 1-to-5 where 5 is new and 1 is non-functional. The teams can rapidly move through a facility because they are only looking for changes since the last assessment (a year ago). Further, while walking through the facility, they interview the facility manager and have a reference list of projects that were completed since the last assessment. When this system was put into place, it was

compared to an actual detailed facility condition assessment survey, and the results were within 10 percent.

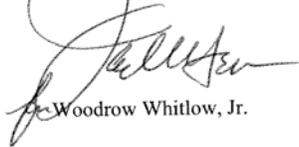
Planned Corrective Action Date: December 31, 2011

Other Matters

In addition to the above response to the recommendations outlined in the draft report, NASA provided technical comments to the draft report, including proposed revisions and/or corrections of factual inaccuracies. Our initial technical comments to the draft report were provided to the OIG via e-mail on July 5, 2011, in order to facilitate the OIG's technical correction process. Additional technical comments are provided here as an enclosure to ensure the report's accuracy.

Again, we appreciate the opportunity to provide a written response to the subject draft audit report, as well as the courtesies extended to the MSD and the OSI by the OIG during the course of the audit. If any additional information regarding our response is required, please contact Fatima Johnson at 202-358-1631 or Rita Svarcas at 202-358-0464.

Sincerely,



Woodrow Whitlow, Jr.

Enclosure

Enclosure
omitted

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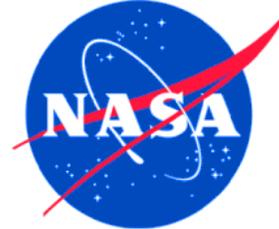
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In order to help us improve the quality of our products, if you wish to comment on the quality or usefulness of this report, please send your comments to Mr. Laurence Hawkins, Audit Operations and Quality Assurance Director, at Laurence.B.Hawkins@nasa.gov or call 202-358-1543.

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