

GAO

Report to the Chairman, Committee on
Science and Technology, House of
Representatives

January 2009

PROPERTY MANAGEMENT

NASA's Goal of Increasing Equipment Reutilization May Fall Short without Further Efforts



GAO

Accountability * Integrity * Reliability



Highlights of [GAO-09-187](#), a report to the Chairman, Committee on Science and Technology, House of Representatives

Why GAO Did This Study

In 2010, the planned retirement of the space shuttle will require the National Aeronautics and Space Administration (NASA) to make disposal and reutilization decisions regarding over 1.2 million types of equipment. To facilitate these and other equipment management decisions, NASA recently invested \$29 million in a new program: the Plant, Property, and Equipment (PP&E) Module—a component of NASA's Integrated Enterprise Management Program. GAO was asked to assess the effectiveness of NASA's processes, systems, and controls for managing its PP&E. This report addresses whether NASA (1) effectively designed controls over steps NASA identified as key to its controlled equipment reutilization process, including sending equipment to disposal, and (2) implemented policies, controls, and processes to enhance equipment reutilization. To answer these questions, GAO reviewed NASA equipment reutilization policy and conducted on-site visits at five NASA centers.

What GAO Recommends

GAO is recommending five actions for improving the effectiveness of NASA's equipment reutilization efforts, including actions directed at obtaining accurate information on equipment descriptions, condition, and availability. NASA agreed with four recommendations, but disagreed with GAO's recommendation to improve equipment availability data. GAO continues to believe additional actions are warranted in this area.

To view the full product, including the scope and methodology, click on [GAO-09-187](#). For more information, contact Susan Ragland at (202) 512-9095 or raglands@gao.gov.

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What GAO Found

Inconsistent descriptions and inaccurate information on the condition of equipment hamper the PP&E Module's ability to produce equipment matches and enhance reutilization. Although descriptions of equipment items are crucial for the new module to succeed in identifying equipment for reutilization, NASA has not provided detailed guidance on what should be included in the description field, leading to widely varying descriptions. For example, the same type of computer server equipment was described as a "disk array," "disk drive unit," and "storage array unit." GAO's physical inspections at two centers found that 83 of the 84 equipment items inspected were incorrectly coded as new and unused in the PP&E Module. These problems may lead to reutilization opportunities being overlooked.

Further hampering equipment reutilization is the PP&E Module's lack of detailed equipment availability information. The module does not identify the extent to which each piece of equipment is in use, necessitating a potentially lengthy search process. For example, an end user searching for an oscilloscope could currently have to contact up to 1,700 other end users to determine the availability status of these equipment items.

These conditions contribute to inadequate end user utilization of the NASA Property Web interface (N-PROP), the PP&E Module's automated component. N-PROP allows end users to perform online equipment management functions, which NASA anticipated would generate cost savings by facilitating equipment reutilization and eliminating manual processes. However, 98 of the 121 end users who were responsible for equipment selected from a NASA-wide statistical sample stated that they had never used either N-PROP or the prior systems, limiting the potential savings from implementing the new PP&E Module.

NASA's existing policies and procedures regarding equipment screenings and annual walk-through inspections—both key controls in the equipment reutilization process—were carried out inconsistently, if at all, at the five centers GAO visited. Without specific guidance on how to implement NASA's equipment screening policy, centers failed to ensure that screenings occurred prior to purchasing new equipment, undermining the purpose of the screenings. Further, NASA does not require users to justify the need to purchase new equipment when a screening has identified equipment available for reutilization. In addition, required walk-through inspections intended to identify idle equipment were not conducted at one center and were ineffective at the other four. Equipment managers did not always follow up to ensure that the PP&E Module was updated and GAO's testing estimated that about 16 percent of NASA's controlled equipment (with a value of at least \$230 million) was improperly listed as being actively in use and had been overlooked during annual walk-through inspections.

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Abbreviations

ARC	Ames Research Center
DFRC	Dryden Flight Research Center
DLIS	Department of Defense Logistics Information System
EMR	Equipment Master Record
GRC	John Glenn Research Center
GSA	General Services Administration
GSFC	Goddard Space Flight Center
HQ	Headquarters
IEMP	Integrated Enterprise Management Program
JFMIP	Joint Financial Management Improvement Program
JSC	Johnson Space Center
KSC	Kennedy Space Center
LARC	Langley Research Center
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NEMS	NASA Equipment Management System
NPD	NASA Policy Directive
NPDMS	NASA Property Disposal Management System
NPR	NASA Procedural Requirements
OIG	Office of Inspector General
PP&E	Property, Plant, and Equipment
SSC	Stennis Space Center

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United States Government Accountability Office
Washington, DC 20548

January 30, 2009

The Honorable Bart Gordon
Chairman
Committee on Science and Technology
House of Representatives

Dear Mr. Chairman:

The National Aeronautics and Space Administration (NASA) stands at one of the most important crossroads it has faced since its inception in 1958. The implementation of its new space exploration policy—A Renewed Spirit of Discovery: The President’s Vision for U.S. Space Exploration¹—and the planned retirement of the space shuttle in 2010 will require NASA to move into a period of major transition. The planned retirement of the shuttle will require the agency to make disposal and reutilization decisions regarding over 1.2 million types of equipment, including “controlled equipment,” which is the focus of this report.² During this transition period, it will be crucial that NASA have the processes, systems, and controls in place to ensure maximum reutilization and effective management and control of its equipment.

In response to your request, this report addresses whether NASA has effectively (1) designed controls over steps NASA identified as key to its controlled equipment reutilization process, including equipment sent to disposal, and (2) implemented policies, controls, and processes to enhance equipment reutilization. During our review, NASA implemented its new Integrated Asset Management Property, Plant, and Equipment

¹The new space exploration policy includes returning humans to the moon by 2020, which is intended ultimately to enable future exploration of Mars and other destinations. To accomplish this, NASA initially plans to (1) complete its work on the International Space Station by 2010; (2) begin developing a new manned exploration vehicle to replace the space shuttle; and (3) return to the moon in preparation for future, more ambitious missions. NASA estimates that it will spend nearly \$230 billion implementing this new exploration policy.

²NASA defines controlled equipment as (1) equipment costing \$5,000 or more that has a service life of 2 years or more, which will not be consumed or expended as part of an experiment, and (2) items that are pilferable or possibly hazardous with acquisition cost of \$500 or more—such as laptop computers, cameras, and cell phones—and weapons and hazardous devices, regardless of acquisition cost. In this report, we refer to controlled equipment as equipment.

(PP&E) Module on May 19, 2008, and we examined the initial implementation of this module. However, we did not review or assess whether NASA followed best practices in customizing and implementing the PP&E Module, which NASA designed to enhance visibility, accountability, and management of PP&E.

In conducting this review, we

- evaluated the design of key steps in NASA's reutilization process by reviewing and comparing NASA's equipment management policies and procedural guidance for equipment management and reutilization with federal property management regulations and other property management standards, including GAO's standards for internal control, and assessed key aspects of PP&E Module controls;³
- reviewed information regarding the equipment reutilization process at five centers,⁴ interviewed relevant NASA personnel to obtain their views on the equipment reutilization process and the design and implementation of the PP&E Module in facilitating equipment reutilization, and observed NASA employees as they demonstrated the PP&E Module's equipment management, search, and disposal capabilities;⁵ and
- selected a statistical random sample of equipment recorded in NASA's legacy NASA Equipment Management System (NEMS) and visited five centers to determine whether equipment recorded as actively being used

³GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

⁴NASA's space exploration, discovery, and research programs are performed largely at its nine centers. Based on our sample selection, we visited the following five centers: Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, Langley Research Center, and Marshall Space Flight Center. These five centers accounted for 78 percent of the total number of equipment items recorded in the NASA Equipment Management System—NASA's legacy equipment management system—as of September 30, 2007.

⁵We interviewed a total of 220 end users and property custodians to obtain their views on the equipment reutilization process and the impact of the PP&E Module on facilitating and increasing equipment reutilization. We interviewed 121 end users and 99 property custodians who were responsible for the items selected in our statistical sample.

was accurately recorded and transferred to the PP&E Module for reuse or disposal.⁶

We conducted this performance audit from December 2007 through January 2009 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. Additional details of our scope and methodology are provided in appendix I.

We requested comments on a draft of this report from the NASA Administrator or his designee. Written comments from the Deputy Administrator are presented and evaluated in the Agency Comments and Our Evaluation section of this report and are reprinted in their entirety in appendix II.

Results in Brief

Inconsistent descriptions and inaccurate information on the condition of equipment hamper the PP&E Module's ability to produce equipment matches. Descriptions should focus on equipment features and capabilities that accurately reflect users' needs based upon performance criteria. Although descriptions of equipment items are crucial for the new module to succeed in identifying equipment for reutilization, NASA has not provided adequate oversight and detailed guidance on what type of information should be included in the description field, leading to widely varying equipment descriptions among the five centers we visited. For example, the same type of computer server equipment was described as a "disk array," "disk drive unit," and "storage array unit." These differences in descriptions may lead to reutilization opportunities being overlooked. Inaccurate information regarding the physical condition—or usability—of equipment in the PP&E Module creates another barrier to reutilization. At two centers, we determined that 83 of 84 equipment items we physically inspected that had been transferred to disposal were incorrectly coded as new and unused in the PP&E Module. These problems discourage use of

⁶The sample was randomly selected prior to the NASA-wide rollout of the new PP&E Module. We traced our sample items to the PP&E Module to confirm that the items were transferred and recorded in the new system. We did not verify whether records related to all items from NEMS were transferred to the new PP&E Module.

the PP&E Module, and several end users told us that they do not have confidence in the equipment's condition as reported in the PP&E Module.

Another potential barrier to equipment reutilization is the limited amount of information in the PP&E Module on the availability of equipment. According to NASA officials, the PP&E Module was intended to facilitate temporary transfers of equipment among end users so they could share, and more fully utilize, equipment. Although the module provides visibility to these types of equipment in use at NASA, it does not identify the extent to which each piece of equipment is being used. Without more specific information on the availability status of equipment, end users must perform a potentially lengthy search by contacting other equipment end users individually to determine if their equipment is available for utilization. An end user searching for an oscilloscope, for example, could currently have to contact up to 1,700 other end users to determine the availability status of their oscilloscopes.

These conditions contribute to inadequate end user utilization of the NASA Property Web interface (N-PROP), the PP&E Module's automated component, limiting potential cost savings. N-PROP allows end users to perform online equipment management functions, such as screening NASA's existing inventory for equipment to reutilize. NASA anticipated that this would generate operational cost savings by facilitating equipment reutilization and eliminating manual processes. However, 98 of the 121 end users we interviewed stated that they had never used N-PROP (or the prior systems) to identify equipment they could reutilize. So, although this lack of use of N-PROP may be due in part to the timing of our review, which coincided with initial implementation of the PP&E Module, these responses also reflect a lack of end user familiarity with and use of equipment management functions in the prior systems. Among the reasons that some end users gave for not using N-PROP were that they preferred new equipment, viewed existing equipment as undesirable, did not consider the PP&E Module equipment information to be reliable, or were unfamiliar with the module. Because most end users we spoke with had not used the PP&E Module at the time of our visits, property custodians had assumed many equipment management responsibilities, lessening the impact of automating this process through N-PROP.

NASA's existing policies and procedures related to equipment reutilization—required equipment screenings and annual walk-through inspections—were carried out inconsistently at the five centers we visited, if at all. Although 92 percent of equipment in the PP&E Module consisted of items costing less than \$25,000, NASA's policy does not require end

users to screen for such equipment. Because NASA has not provided specific guidance on how to implement its screening policy, the centers have failed to implement effective controls to ensure that required screenings occur before new equipment is purchased. One problem was that the five centers we visited were not following up to see if end users were purchasing new equipment in lieu of reutilizing equipment items identified during screening. For example, when one screener notified a requester of a potential equipment match, the screener was told that new equipment had already been purchased, undermining the purpose of the screening. Further, NASA policy does not require that requesters utilize such equipment or justify their need for new equipment. NASA also lacked the oversight to ensure that required screenings occurred.

Required annual walk-through inspections—intended to identify idle equipment and ensure that it is fully utilized—were not conducted at one center and were conducted to varying degrees at the other four centers. In addition, the four center equipment managers told us that they did not follow up to ensure that the equipment management system—neither the legacy system nor the PP&E Module—was updated to reflect the changes identified by the inspections. Because of these inconsistencies, NASA was unable to demonstrate whether the annual walk-through inspections met their objectives. Since many end users we interviewed were not using the PP&E Module to update information on their equipment, it is even more critical to perform walk-through inspections correctly and use them as a mitigating control. Our testing of equipment in NASA’s legacy NEMS (as of September 30, 2007) estimated that about 16 percent of NASA’s controlled equipment (with a value of at least \$230 million) was improperly listed as being actively in use in an ongoing program, and had been overlooked during annual walk-through inspections.

We are recommending five actions for improving the effectiveness of NASA’s equipment reutilization efforts. These recommendations relate to actions needed to ensure that the PP&E Module contains accurate information on equipment descriptions, condition, and availability; the importance of providing incentives to end users to reutilize equipment; enhancing NASA policy for screening for available equipment; and improving procedures for and oversight of walk-through equipment inspections. NASA concurred with four of our five recommendations. NASA did not concur with our recommendation to modify the PP&E Module to capture information on the anticipated and actual usage (availability) of equipment assigned to end users. NASA stated that because NASA’s equipment listed as “active” is now visible NASA-wide, there is no need to design and implement a separate additional status

category in the PP&E Module. NASA further commented that the current visibility of “active” equipment provides the opportunity for programmatic, technical, and scientific experts to discuss possible reuse through loans or borrowing, coordinating through their property custodians or equipment managers.

We continue to believe that not including information in the PP&E Module on the availability of equipment (the extent to which “active” equipment is actually or anticipated to be used) presents a barrier to equipment reutilization. Specifically, because the module does not provide status information on the extent to which each piece of “active” equipment is being (or is likely to be) used, such as on a weekly or monthly basis, potential end users must perform a potentially lengthy labor-intensive search by contacting other equipment end users, and discussing actual and intended use, to determine the extent to which the equipment listed as “active” is actually available for utilization. In addition, the Financial Systems Integration Office’s property management systems requirements initially published by the Joint Financial Management Improvement Program (JFMIP) directs that property management systems capture an equipment item’s current use status, which includes identifying whether an equipment item is currently in use.

Background

NASA’s mission is to pioneer the future in space exploration, scientific discovery, and aeronautics research. To accomplish its mission, NASA procures, fabricates, and maintains significant amounts of equipment. For example, as of September 30, 2008, NASA reported that it had approximately 307,000 controlled equipment items, costing \$11.5 billion.⁷

In April 2000, NASA launched the Integrated Enterprise Management Program (IEMP), which is expected to improve the efficiency of many of its financial and management functions. The IEMP system is intended to promote standardization and integration of business processes and systems across the agency, and various components have been designed and implemented since its launch in 2000. On May 19, 2008, NASA implemented the PP&E Module agencywide, which cost about \$29 million, and is designed to improve its management of and provide accountability over the entire life cycle of controlled equipment.

⁷Of this amount, \$10.5 billion was controlled equipment costing \$25,000 or more.

The PP&E Module replaced NASA’s legacy equipment management systems—NEMS and the NASA Property Disposal Management System (NPDMS). The module was intended to allow end users to perform such tasks as equipment searches—to identify equipment that may be available for reutilization—acceptance, rejection, and transfer. The module was designed, among other things, to allow equipment end users to compare their equipment needs with equipment located anywhere within NASA through two critical reutilization subcomponents, N-PROP and DSPL. N-PROP is a Web-based interface that allows end users to directly access the module and view equipment located at all NASA centers, while DSPL is the new disposal interface, which allows users to view equipment located in disposal warehouses agencywide. Prior to the implementation of the PP&E Module, NASA employees and contractors were limited to viewing underutilized or excess equipment physically located at their local centers.⁸

NASA anticipates annual operational cost savings as a result of implementing the PP&E Module. As part of the President’s fiscal year 2009 budget submission, NASA reported that the implementation of the PP&E Module would result in annual operational cost savings of approximately \$19.6 million by eliminating manual processes and increasing the reutilization of equipment.

NASA’s Property Management Organizational Responsibilities

According to NASA’s equipment management policy and procedural guidance, property management and equipment reutilization at NASA involves several key players:⁹

- The Logistics Management Division, located at NASA headquarters in Washington, D.C., is part of NASA’s Office of Infrastructure and Administration and is responsible for establishing policies and procedures that govern the agency’s equipment management activities. The Logistics Management Division is also responsible for (1) assisting NASA centers in the development and operation of internal processes, procedures, and

⁸NASA defines excess and underutilized equipment as equipment that is no longer required for the performance of specific NASA requirements.

⁹National Aeronautics and Space Administration, *Equipment Management*, NASA Policy Directive (NPD) 4200.1B (rev. Jan. 23, 2006); *Equipment Management Procedural Requirements*, NASA Procedural Requirements (NPR) 4200.1F (rev. May 19, 2008); *NASA Personal Property Disposal Policy*, NPD 4300.1B (rev. Jan. 31, 2006); and *NASA Personal Property Disposal Procedural Requirements*, NPR 4300.1A (rev. Feb. 17, 2006).

systems to ensure their compatibility with agency programs; (2) establishing necessary agency performance measures and reports on the overall implementation of equipment management programs; (3) conducting reviews and overseeing the implementation of equipment management activities; and (4) defining training requirements to ensure properly trained property personnel across the agency.

- Individual end users, such as scientists or engineers, have a duty to protect and conserve government property assigned to them and should not use such property, or allow its use, for other than authorized purposes. Each piece of equipment is assigned to an end user, who is responsible for ensuring that the equipment is used only in approved NASA programs and projects and notifying the property custodian when the equipment is no longer being actively used.
- Property custodians are designated by the director or chief for each property management area or program. Their responsibilities include maintaining records for all controlled equipment assigned to them, identifying controlled equipment no longer needed for NASA programs or projects, and coordinating its disposition with the end users.
- NASA division directors (or equivalent organization heads) are the primary officials responsible for equipment assigned to their organizations. This responsibility includes performing annual walk-through inspections to identify inactive equipment and ensuring that equipment no longer required for the performance of a specific NASA program or project is made available to others or properly disposed of.
- Supply equipment management officers are responsible for managing each centers' equipment program, including implementing the necessary equipment control procedures to ensure proper accountability for center equipment; establishing a process to ensure that all personnel associated with the utilization of government equipment receive documented, up-to-date property end user training; ensuring that end users are aware of the requirement to identify inactive equipment and ensure its reuse or disposal; and designating property disposal officers and center equipment managers to perform screenings for equipment estimated to cost \$25,000 or more.
- Property disposal officers are responsible for managing and screening NASA's excess equipment inventory—equipment recorded in DSPL—prior to a NASA or contractor employee initiating a purchase request for new equipment costing \$25,000 or more.

-
- The center equipment managers are responsible for ensuring each center's compliance with the federal property management regulations to maximize equipment reutilization and to minimize procurement of new equipment. New purchase requests costing more than \$25,000 are to be routed through the center equipment manager, or designee, to perform a second screening of excess equipment recorded in the PP&E Module. In addition, the center equipment manager is responsible for ensuring that equipment records are adjusted to reflect the results of all equipment inspections.

Overview of Reutilization Process at NASA Centers

To reduce the unnecessary procurement of new equipment, federal property management regulations require each executive agency to make underutilized and excess equipment available for reutilization within the agency and, if not needed, to other agencies.¹⁰ NASA equipment management policy and procedural guidance require centers to continuously inspect equipment under their control to ensure maximum utilization.¹¹ Excess and underutilized equipment that is available for reutilization should be identified in the PP&E Module through ongoing review by equipment end users, annual walk-through inspections, and each center's periodic physical inventories.¹²

Once a piece of equipment is determined to be excess or underutilized, NASA end users have the option to decide whether to transfer it to disposal—through the property disposal officer—or make it available to others through a transfer. If the end user elects to send the equipment to disposal, the equipment is physically transferred to the center's disposal warehouse and made available—through DSPL—to all NASA centers for 21 days. If the equipment is not claimed by any NASA projects or programs within this time period, it is transferred to the General Services

¹⁰Federal Property Management Regulations, *codified at* 41 C.F.R. pt. 102-36, *Disposition of Excess Personal Property*.

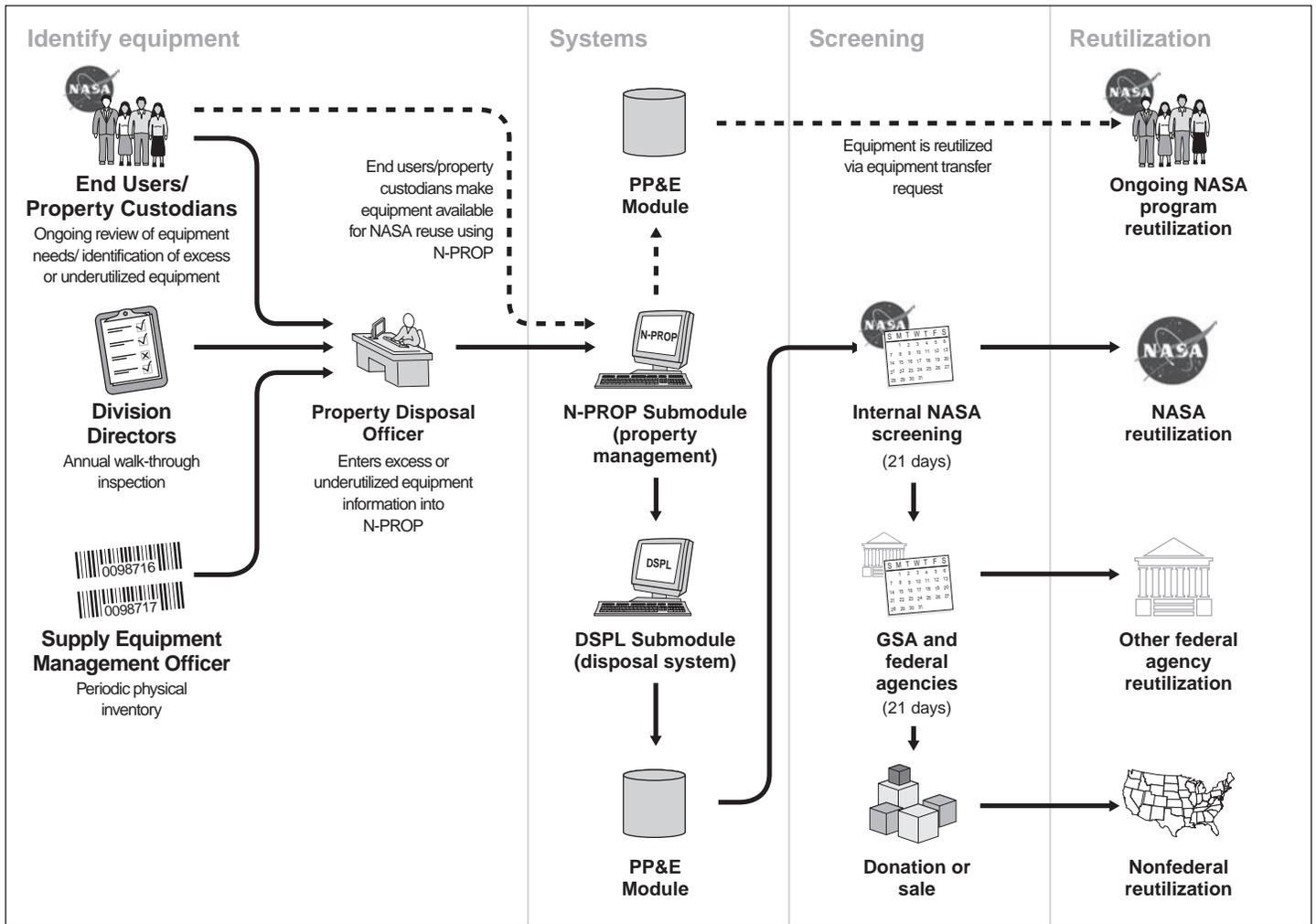
¹¹National Aeronautics and Space Administration, *Equipment Management Procedural Requirements*.

¹²NASA's equipment management policy and procedural guidance require NASA to perform physical inventories at least on a triennial basis, but they can be conducted more often. Physical inventories are one method used by NASA to identify excess, unused, or underutilized equipment for reutilization. However, we did not assess the impact of the physical inventory process on equipment reutilization or the effectiveness of physical inventories in identifying equipment for reutilization as part our review.

Administration (GSA) and made available to other federal and state agencies for 21 days and is donated or sold to other institutions thereafter.

The PP&E Module was designed to facilitate the process of transferring excess and underutilized equipment among end users by providing transparency on all NASA-wide equipment and allowing end users to directly make excess equipment available to other end users. End users, who are not currently using a certain equipment item, may decide not to transfer it to disposal because it is still in good working condition, continues to have technological relevance, or has potential for future use within the user's project or program area. Upon using the module to find existing equipment that may suit their needs, end users are to contact other end users to whom that equipment is assigned to determine if it is available for reutilization. If available, a direct end user to end user transfer can take place. Figure 1 shows the key steps involved in NASA's equipment reutilization process.

Figure 1: NASA Equipment Reutilization Process



Source: GAO analysis based on NASA data.

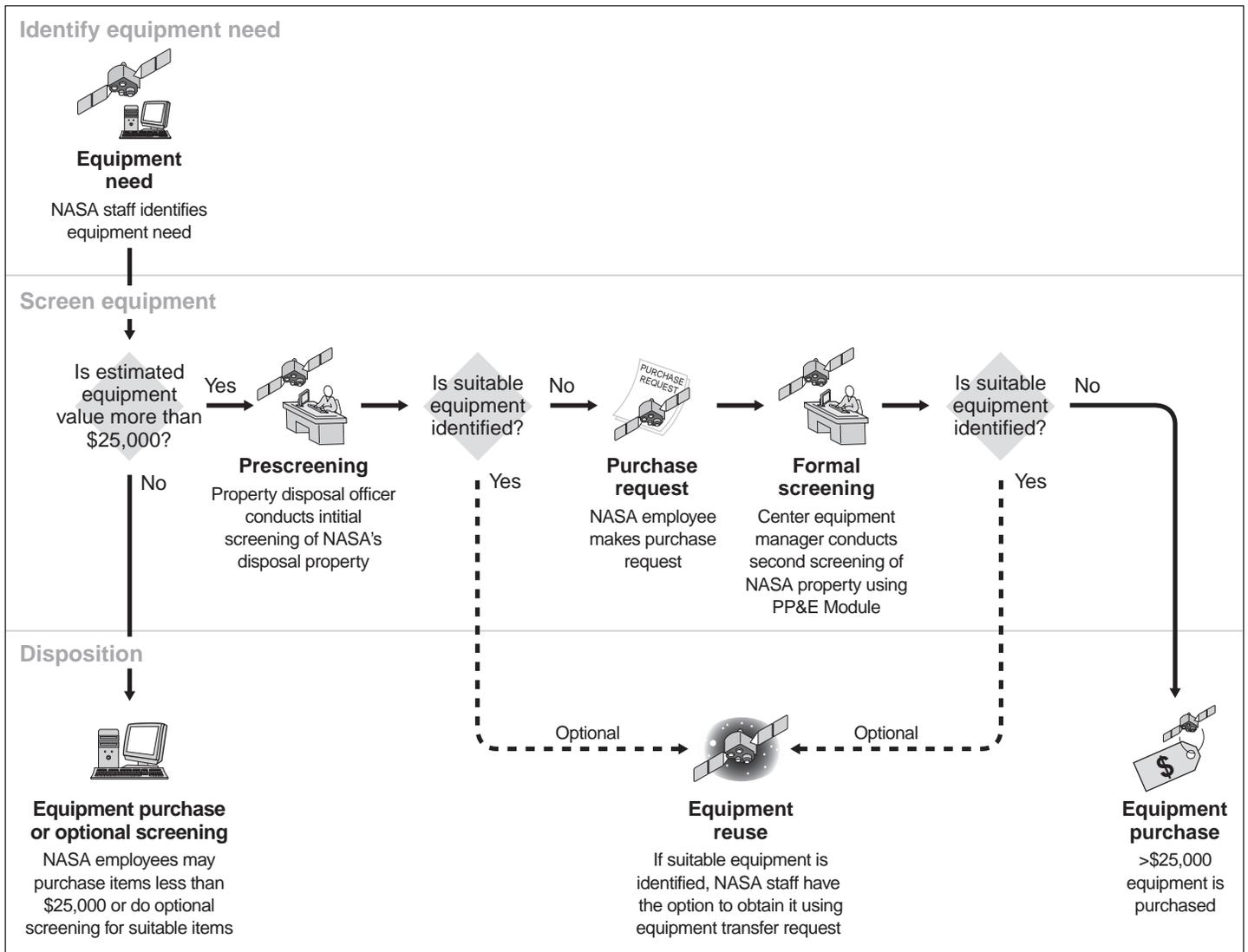
Overview of NASA's Equipment Screening Process

Equipment screening is a key part of NASA's reutilization process and is critical to identifying controlled equipment that can be reutilized. Prior to purchasing new equipment, NASA equipment management policy and procedural guidance require NASA employees and contractors to evaluate alternative methods for meeting their equipment needs, such as utilizing existing equipment and leasing or borrowing equipment from other NASA projects or programs on a temporary basis. As such, equipment screening is a control that should prevent unnecessary new equipment purchases

when equipment is on hand and available to meet the purchaser's needs. However, users are not required to reutilize equipment identified through the screening process or to provide any justification for purchasing new equipment instead.

Prior to initiating a procurement request for controlled equipment that is expected to cost \$25,000 or more, NASA equipment policy and procedural guidance require the requesting office to contact the center's property disposal officer, or designee, and request a screening of NASA's equipment that has been transferred to disposal to determine the availability of equipment that could satisfy the requirement. If a match is not identified, a purchase request can be prepared. All such purchase requests (\$25,000 or more) are to be routed through the center equipment manager, or designee, who is required to conduct a second screening of NASA's existing equipment recorded in the PP&E Module before processing the purchase requests. The center equipment manager, property disposal officer, or their designees are required to search based on the manufacturer model and, if no items are found, optionally on the item description. As an optional screening step, NASA guidance also permits the screening of non-NASA excess equipment sites—such as GSA's XCESS (excess equipment depository) database. For controlled equipment purchases of less than \$25,000, NASA's policy and procedural guidance encourage, but do not require, end users to use the PP&E Module to search NASA-wide for excess equipment. Figure 2 illustrates NASA's equipment screening process.

Figure 2: NASA's Equipment Screening Process



Source: GAO analysis based on NASA data.

Ineffective Controls Hindered Equipment Reutilization

Improvements in the design of key controls associated with the PP&E Module could help NASA increase equipment reutilization and better enable it to realize cost savings. Inconsistent and unreliable descriptive information and limited information about equipments' availability hinder NASA's ability to effectively identify and reutilize equipment. If end users

lack confidence in the reliability of the PP&E Module's information they will be less likely to use it, thereby limiting opportunities to identify equipment available for reutilization.

Unclear Guidance on Equipment Descriptions and Usability Prevent Matches That Could Identify Equipment for Reuse

Inconsistent descriptions, inaccurate information on physical condition, and limited information about the equipment's availability hamper the PP&E Module's ability to produce equipment matches. Though NASA equipment management policy and procedural guidance only require screeners to search by manufacturer model, screeners told us that they seldom used manufacturer model numbers, but immediately searched the description field and that the model numbers were not always available. When users ask for a new piece of equipment, such as a digital camera, they do not need to provide a preferred manufacturer or model number. The descriptions should focus on equipment features and capabilities that accurately reflect users' needs based upon performance criteria, a basic component of the federal procurement process. The descriptions of equipment items, therefore, are crucial to the success of the new module in identifying equipment for reutilization.

NASA has not provided adequate oversight and detailed guidance on what type of information should be included in the description field. We found that without detailed guidance, equipment descriptions varied widely among NASA centers. According to NASA officials, along with entering model number information, property management officials are responsible for entering the descriptions in the PP&E Module using the Department of Defense Logistics Information System (DLIS) cataloging system.¹³ For example, a digital phosphor oscilloscope, a color digital oscilloscope, an analog oscilloscope, and an infinium oscilloscope can all be described as an oscilloscope. Unfortunately, we found that this system does not ensure that equipment descriptions are consistently and accurately entered into the PP&E Module. For example, items that should have been listed as video frequency equipment racks were described as "disciplined frequency standard" and a camera lens cover as a "rear cover multicontrol." In addition, the same type of computer server equipment was described as a "disk array," "disk drive unit," and "storage array unit." Similarly, a generator was variously described as a "signal plug in generator,"

¹³The DLIS cataloging system is a centralized and consolidated cataloging activity for all Department of Defense cataloging, which provides a centralized federal item name directory that provides approved names for equipment.

“modulator,” “plug in unit,” and “tuning unit.” These differences in descriptions may lead to reutilization opportunities being overlooked.

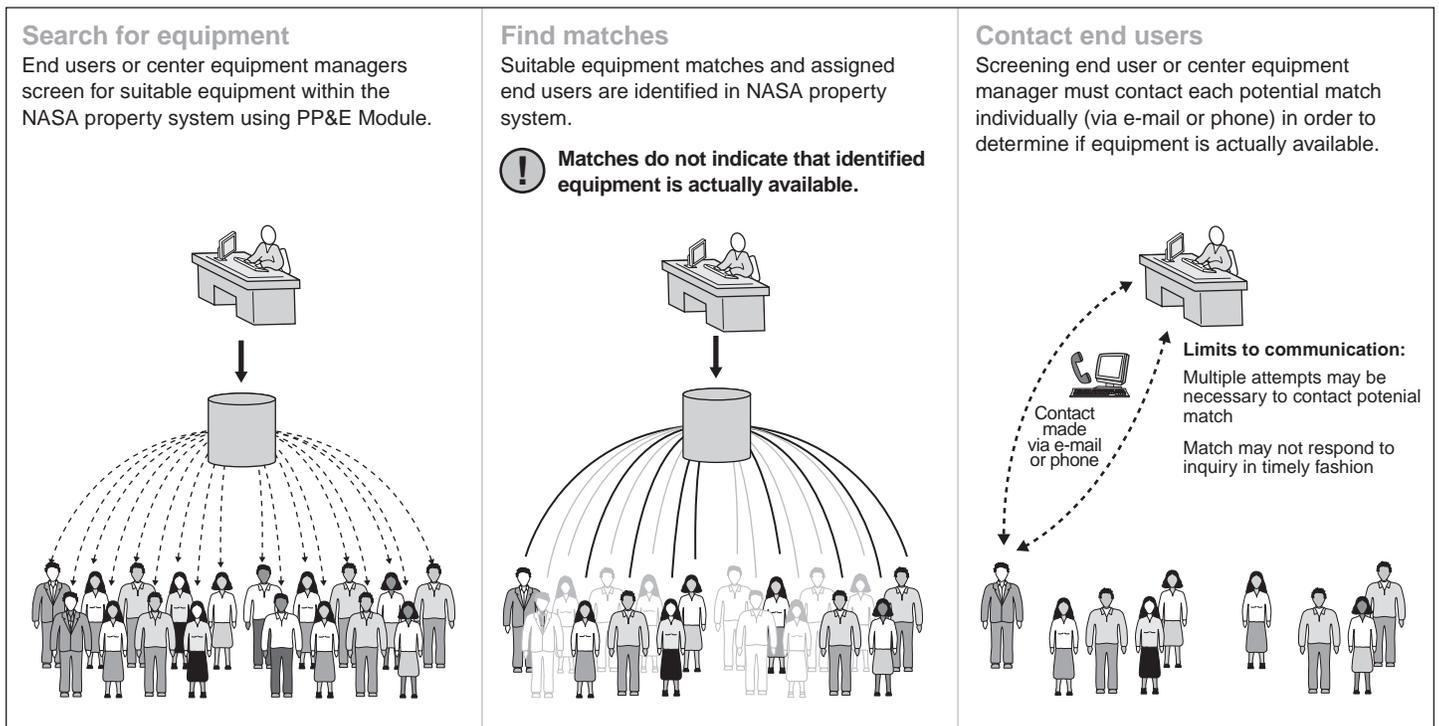
Inaccurate information regarding the physical condition—or usability—of equipment in the PP&E Module creates another barrier to reutilization. The PP&E Module has a field where users can indicate the physical condition of equipment items. At two centers, our physical inspection of 84 equipment items that were transferred to disposal determined that 83 of the items were incorrectly coded as new and unused in the PP&E Module. Based on our physical inspections of these items, none of the 83 equipment items were in original packaging and all appeared used. Three of the 83 equipment items were computers with their hard drives removed, in accordance with NASA policy, and thus not in usable condition. Further, several end users we interviewed reported that they had retrieved excess computers described as new and unused (in the NASA legacy property disposal system NPDMS) only to find that the hard drives had been removed. As a result, these end users told us that they do not have confidence in the equipment’s condition as reported in the PP&E Module.

Limited Information on Equipment Availability Impedes Reutilization

Another potential barrier to equipment reutilization is the limited amount of information in the PP&E Module on the availability of equipment. All equipment listed in the PP&E Module is categorized as actively in use until a determination is made that it will no longer be needed and the applicable record is transferred to the DSPL submodule and classified as inactive. According to NASA officials, this “active” equipment includes equipment that is used daily as well as idle equipment that is still in working condition—and still technologically relevant—that may be needed at some future date by the end user to whom it is assigned. For example, equipment that is used on a daily basis; on a regular basis, such as 2 days a week or monthly; or episodically—2 months and then not again for 2 months—or even equipment that is used once a year is all classified as “active” in the module. According to NASA officials, the PP&E Module was partially designed to facilitate temporary transfers of this idle equipment among end users. Although the PP&E Module provides visibility to these types of idle equipment, it does not identify the extent to which the individual equipment items are being used. Lacking more specific information on the availability status of equipment, end users must perform a potentially lengthy search process of calling or e-mailing other equipment end users individually to determine if the equipment identified through the PP&E Module is available for utilization, as shown in figure 3. As of September 30, 2008, NASA’s PP&E Module reported approximately 60,000 computers, 38,000 display units, 10,000 printers, 10,000 computer

servers, 2,700 digital cameras, and 1,700 oscilloscopes. An end user searching for an oscilloscope, for example, would currently have to choose which of 1,700 other end users to contact to determine the availability status of their “active” oscilloscopes. Several equipment end users and property custodians we interviewed told us that information relating to the availability status of the equipment would be critical in deciding whether to search for existing equipment to reutilize.

Figure 3: Equipment End User Screening Process in PP&E Module



Source: GAO analysis based on NASA data.

According to IEMP program managers, a field indicating the availability status of equipment was not included in the PP&E Module because the information in NASA’s legacy NEMS, which included an equipment availability status field, was not accurate. Rather than taking the necessary steps to improve the accuracy of the information in NEMS, NASA elected to exclude this field from the PP&E Module. However, the Financial Systems Integration Office’s property management systems requirements

(initially published by JFMIP) directs property management systems to capture an equipment item's current use status, which includes identifying whether an equipment item is currently in use.¹⁴

Because of unreliable equipment descriptions and limited information on availability, NASA did not require the PP&E Module to consistently identify available equipment that could satisfy the needs of equipment requesters. At the time of our visits to the five centers—occurring from May through July 2008—the equipment screeners told us that the searches that they performed up to that point in fiscal year 2008 had failed to identify any equipment matches that would satisfy the needs of equipment requesters.¹⁵ Because the NASA center screeners we interviewed did not maintain detailed documentation on the number of equipment searches performed during the fiscal year, we were unable to determine the number of screenings that had been made up to the time of our visit.

Inadequate End User Participation May Limit Potential Cost Savings

Unreliable equipment descriptions and limited information on availability contribute to inadequate end user utilization of N-PROP and limit potential cost savings that could be achieved through process automation and increased equipment reutilization. N-PROP is the window to the PP&E Module and the only automated component that provides direct access to the equipment database. It allows end users to perform online equipment management and accountability functions, such as accepting or rejecting new equipment from vendors, declaring equipment as excess, and screening for equipment to reutilize throughout the agency. According to a September 2008 NASA Office of Inspector General (OIG) report, it was anticipated that these features would generate operational cost savings and reduce unnecessary procurements by facilitating equipment

¹⁴*Property Management Systems Requirements, Federal Financial Management System Requirements 4*, Joint Financial Management Improvement Program, October 2000. See Financial Systems Integration Office Web site for system requirements documents at http://www.fsio.gov/fsio/fsiodata/docs_systemrequirements.shtml to find a copy of these requirements.

¹⁵After our visit to one center, one equipment screener informed us that she had found equipment matches for three purchase requests from July through September 2008. However, for various reasons, none of the matches were used to satisfy the needs of the requester. One requester preferred to purchase new equipment, the second purchased new equipment prior to the screening process, and the third was unable to obtain the equipment because the end user was still actively using the equipment.

reutilization, promoting intercenter equipment transfers and loans, and eliminating manual processes.¹⁶

The majority of end users we interviewed—98 of 121—stated that they had never used N-PROP (or the prior systems) to screen equipment for reutilization. Although this lack of use of N-PROP may be due in part to the timing of our review, which coincided with initial implementation of the PP&E Module, these responses also reflect a lack of end user familiarity with and use of equipment management functions in the prior systems. In addition, as the NASA OIG reported in September 2008, NASA took steps to incorporate stakeholders in the requirements development process of the PP&E Module to ensure that their needs were met. Stakeholders identified and reviewed project requirements and, during system development, helped determine whether each portion of the system would meet their requirements. However, during our site visits we observed that few end users appeared to be interested in learning about the new module or taking a greater role in equipment reutilization. The reasons end users said that they had not used the PP&E Module included that they (1) had not taken the training NASA has made available on the new module, (2) were not familiar with the equipment management and screening features, or (3) had not obtained a password needed to use the module. Considering the key role that end users need to play in achieving cost savings through equipment management responsibilities, these facts indicate that steps taken by NASA to encourage end user participation may have been insufficient to change end users' perceptions and expectations.

Our interviews further disclosed that a substantial number of end users did not view equipment management as necessary or important, another factor that could limit the likelihood that they would use the new module. Among the reasons that some end users gave for not screening through N-PROP before initiating a new procurement was that they preferred new equipment; others told us that they viewed existing equipment as undesirable and unlikely to meet their projects needs and they did not consider the equipment description and physical condition reported in the PP&E Module to be reliable, or that they were unfamiliar with the module. Furthermore, in addition to responding to our interview questions, 29 of

¹⁶National Aeronautics and Space Administration, Office of Inspector General, Final Memorandum on NASA's Development of the Integrated Asset Management—Property, Plant, and Equipment Module to Provide Identified Benefits, IG-08-032 (Washington, D.C.: Sept. 25, 2008).

the 121 end users we spoke with volunteered that they had more important tasks to perform than managing equipment, did not view property management as a key responsibility in their day-to-day duties, did not want to learn how to use the module for equipment management, or were not familiar with or had never heard of the new module.¹⁷

End users were not required to use the PP&E Module and most end users we spoke with had not used the PP&E Module at the time of our visits. Therefore, property custodians had assumed many equipment management responsibilities, perpetuating manual procedures that the new module sought to automate. Because property custodians cannot accept, receive, or transfer equipment for the end users, they must obtain the end users' signatures and submit the documentation to the centers' logistics property management officials. As we previously reported, the number of equipment items and end users assigned to each property custodian can vary widely—with some property custodians responsible for as many as 4,000 equipment items.¹⁸ According to NASA officials, one use envisioned for the PP&E Module includes end users negotiating with each other to work out when to share equipment. This is one of NASA's approaches to enhance equipment reutilization, but if many end users are not using the system this is unlikely to occur. It is unrealistic to expect property custodians to keep up on the nuances of equipment usage, such as whether equipment that is used on an episodic basis is currently in use or not, and therefore they are not in a position to determine whether other uses could be negotiated. Continuing to rely upon property custodians rather than focusing efforts to encourage direct end user involvement will likely reduce the potential savings that NASA intended to achieve through the PP&E Module by automating manual processes. Therefore, it will be important that NASA take steps to enhance or provide additional incentives so that end users recognize the benefits of reutilizing equipment and encourage them to use the PP&E Module to identify potential matches and negotiate with other users to help NASA increase equipment reutilization. Steps to enhance end user participation could include setting performance expectations for end users, setting equipment reutilization goals by program or project, tracking agency performance measures on

¹⁷We interviewed 220 equipment end users and property custodians—121 end users and 99 property custodians—during our visits to the five centers.

¹⁸GAO, *Property Management: Lack of Accountability and Weak Internal Controls Leave NASA Equipment Vulnerable to Loss, Theft, and Misuse*, GAO-07-432 (Washington, D.C.: June 25, 2007).

equipment reutilization, providing awards and recognition to highlight effective reutilization practices, emphasizing available N-PROP training, and including goals for equipment reutilization in Senior Executive Service contracts.

NASA Has Not Implemented Effective Policies and Detailed Procedures to Enhance Equipment Reutilization

NASA's existing policies and procedures related to equipment reutilization were either not being carried out or were being carried out inconsistently at the five centers we visited. In addition, NASA's equipment screening policy is not sufficiently detailed. Before purchasing equipment costing \$25,000 or more, NASA equipment management policy requires centers to screen the agency's property records to determine whether existing equipment could satisfy the request, but does not require that requesters utilize such equipment or justify their need for new equipment.¹⁹ NASA further requires that annual walk-through inspections be conducted to identify excess or underutilized equipment that may be reutilized elsewhere in the agency. These walk-through inspections provide a key control to help ensure that equipment is fully utilized. During our visits we found that not every center complies with these requirements and those that were doing the walk-through inspections had different processes and effectiveness, sometimes undermining NASA's goal of equipment reutilization. As noted earlier, end users' perception of the new module may limit the extent to which they use it for managing property, including equipment reutilization.

Equipment Screening Policies and Procedures Are Not Sufficient to Ensure Comprehensive and Consistent Implementation of NASA's Equipment Reutilization Policy

Although NASA provides general screening policy for centers, it has not provided centers with specific guidance on how to implement this policy to conduct effective and consistent screenings. NASA encourages centers to customize their equipment management procedures to meet local requirements; however, none of the five centers we visited had developed local screening procedures despite the lack of reliable information in the PP&E Module that would help identify potential matches. The centers have failed to implement effective screening controls to ensure that existing equipment is screened before they purchase new equipment. NASA's screening policies state that all center procurement requests for items of equipment with an estimated cost of \$25,000 or more must be

¹⁹NASA's equipment purchases costing \$25,000 or more for fiscal year 2008 make up about \$748 million, or 90 percent, of the \$831 million in equipment purchases recorded in NASA's PP&E Module as of September 30, 2008.

routed through the center equipment manager for screening. However, as of September 30, 2008, 92 percent of NASA's controlled equipment consisted of items costing less than \$25,000.

In addition, the policy does not require reuse nor does it ask for a justification for decisions not to reuse available equipment. Further, the policy does not require users to provide support that they have a valid program need to purchase new equipment instead of reutilizing available equipment. Interviews with equipment screeners at the five centers we visited disclosed that the screening processes varied among the centers and none of the processes provided assurance that existing equipment was thoroughly screened on a consistent basis before new equipment was purchased. One problem was that NASA has not required uniform implementation of a PP&E Module feature that officials from two of the five centers we visited were unaware of, and thus were not using. This feature was designed to suspend new procurements until the screening process has been completed. Another problem was that the five centers we visited were not following up to see if end users were purchasing new equipment in lieu of reutilizing equipment items identified during screening. One center did not have a designated center equipment screener to conduct searches. Another center made equipment procurements regardless of the outcome of the screening process. For example, an equipment screener at one of the centers identified a digital oscilloscope—an instrument commonly used at NASA for testing—that was available at another center. However, upon notifying the purchaser that a potential equivalent oscilloscope was available, the screener was told that the requester preferred to purchase a new oscilloscope. In another case, upon notifying a purchaser who had requested a spectrometer—test equipment—that six equivalent spectrometers were located, the screener was told that new equipment had already been purchased. As a result, the screening process failed to prevent the procurement of new equipment when equivalent equipment was available.

Although the other three centers were using the procurement suspension control function to ensure screening, the equipment screener for one center told us that only NASA contractor equipment requests were screened, rather than all new procurements. Furthermore, we found that NASA's Logistics Management Division lacked the oversight to ensure that this required screening occurs. At the time of our visits, 124 of 220 equipment end users and property custodians stated that they had never requested a screening through the property disposal officer or center equipment manager or used the PP&E Module or its predecessor—

NEMS—to screen existing equipment before initiating and processing a request to purchase equipment.²⁰

NASA-Wide Implementing Procedures for Walk-Through Inspections Are Not Sufficient to Ensure Consistent Performance

At the time of our visits the five NASA centers were not conducting required annual walk-through inspections consistently, and sometimes not at all. According to NASA equipment management policy, the annual walk-through inspections are intended to identify equipment that is not being used or is no longer needed for ongoing NASA programs or projects, and can be made available for utilization in another program or NASA center or transferred to disposal. At each NASA center, the division director or equivalent organization head is responsible for ensuring that his or her staff conduct annual walk-through inspections. After staff complete an annual walk-through inspection, the division director is required to prepare and send a written memorandum, documenting the results of the inspection, to the center's supply equipment management officer. In addition, the center equipment manager is required to ensure that the PP&E Module is updated to reflect the results of the inspection.

One of the five centers we visited did not conduct these required inspections and the other four did so in varying manners and to varying degrees. For example, none of the centers maintain sufficient documentation to determine whether the PP&E Module was updated to reflect the results of the walk-through inspections, thus offering no assurance that this control was effective. At two of these four centers, directors prepared memorandums to document the results of the annual walk-through inspections that outlined the equipment items' names and equipment control numbers and what specific actions were needed. At the remaining two centers, directors documented that walk-through inspections were performed, but not the detailed results of the inspections. All four center equipment managers told us that they did not follow up to ensure that the equipment management system—either NEMS or the PP&E Module—was updated to reflect the changes identified by the inspections. And none of the centers maintained any evidence to show when the property system was updated, if it was updated at all.

²⁰We asked 220 equipment end users and property custodians—121 equipment end users and 99 property custodians—questions relating to their experience with screening existing equipment before purchasing new equipment.

Because of these inconsistencies, NASA was unable to demonstrate whether the annual walk-through inspections met their objectives. Our testing of equipment in NASA's legacy NEMS (as of September 30, 2007) estimated that about 16 percent of NASA's controlled equipment (with a value of at least \$230 million²¹) was improperly listed as being actively in use in an ongoing program, and had been overlooked during annual walk-through inspections. In accordance with NASA equipment management policy, this equipment should have been identified as excess or underutilized and made available for reutilization or disposal. We selected our sample in April 2008, before the PP&E Module's implementation. All equipment in our sample was transferred from NEMS to the PP&E Module, including the sample items that were inaccurately described as actively in use. Table 1 contains examples of equipment that we identified during our visits to the five centers during the months of May through July 2008 that was inaccurately reported in NASA's NEMS as actively used by a NASA program or project.

Table 1: Examples of NASA Equipment That Walk-Through Inspections Did Not Identify as Excess or Underutilized (as of September 30, 2007)

Equipment	Initial cost	Time elapsed since last use	Comments
Micro computer	\$2,509	About 10 years	Annual walk-through inspections failed to identify the computer, along with other equipment, that remained unused after the project closed.
Computer display unit	633	Over 3 years	The unit was stored with other unused equipment. Another display unit costing \$934 in storage had not been used in over 2 years.
Oscilloscope	8,783	Over 2 years	The end user had not used this oscilloscope, commonly used for testing at NASA, for over 2 years. The end user has no plans to use it in the near future.
Controller vacuum pump	30,200	About 1 year	The pump was assigned to an end user who passed away, and although the equipment was transferred to a new end user, it had never been used.
Transmitter	13,137	About 6-8 months	The transmitter had not been used for a year, and the end user did not anticipate using it on future projects.
Video camera	3,523	Over 1 year	The end user had not used the camera and did not anticipate using it on future projects.
Printer	1,780	Over 18 months	At the time of our visit, the printer was not connected and was stored in an empty cubicle.
Power module	1,250	Over 18 months	The end user did not anticipate using the module as part of any ongoing projects.

Source: GAO analysis of NASA data.

²¹This estimated value represents the 95 percent confidence lower bound of our random statistical sample projection. See app. I for more details.

We did not assess whether any of the above equipment could have been reutilized to avoid the purchase of new equipment because NASA could not provide this information. However, these items should have been identified during prior annual walk-through inspections and the property management systems should have been updated to reflect that this equipment was not being used. Correctly following NASA policy in this area would have increased the chance that the equipment could have been reutilized by other end users. In addition, NASA officials reported that in fiscal year 2008, the agency reinstated performing compensating controls reviews, which are designed to evaluate the adequacy and consistency of NASA policy execution and procedural compliance with NASA guidance. NASA reported that it conducted four reviews in the third and fourth quarters of fiscal year 2008.

Conclusions

NASA has attempted to more efficiently manage its controlled equipment. Given NASA's current and projected budget constraints, cutting costs through equipment reutilization and improved equipment management efficiencies will be critical if it is to free up vital resources for other mission-related objectives. Unfortunately, ineffective controls over equipment reutilization and limited utilization of the new system may prevent the PP&E Module from fully delivering on its potential cost savings. These shortcomings may prevent the PP&E Module from providing NASA employees and contractors with the tools needed to make informed decisions regarding the disposal or reutilization of equipment, including over 1.2 million types of equipment if the space shuttle is retired in 2010 and NASA transitions to its new space exploration policy as planned.

Strong leadership will be critical to promoting and enforcing existing equipment reutilization requirements, emphasizing the need for better equipment accountability, and stressing the importance of reutilizing equipment. Strengthening NASA-wide oversight and monitoring controls and processes could help NASA managers more effectively oversee NASA's compliance with its policies and procedures. Effectively managing the new PP&E Module could help NASA achieve increased savings from equipment reutilization and provide Congress and other stakeholders with more accurate and up-to-date information needed to make sound management decisions.

Recommendations for Executive Action

We recommend that the NASA Administrator direct the Assistant Administrator for the Office of Infrastructure and Administration to take the following five actions to enhance comprehensive and consistent equipment reutilization:

- Develop and implement specific guidance, establish a mechanism to oversee implementation, and provide the necessary training to assist NASA employees and contractors in providing clear, consistent, and accurate equipment descriptions and key information in the PP&E Module, including the physical condition (usability). NASA management should determine the extent to which it is cost effective to apply this new guidance retroactively.
- Modify the PP&E Module to capture information on the anticipated and actual usage (availability) of equipment assigned to end users at the time the equipment is accepted and provide a mechanism to ensure that this information is updated as appropriate.
- Provide incentives so that end users recognize the benefits of reutilizing equipment and encourage them to fully use the PP&E Module to identify potential matches and negotiate with other users to help NASA increase equipment reutilization.
- Revise NASA equipment management policy to require end users to justify any valid program needs to purchase new equipment instead of reutilizing available equipment and consider whether the \$25,000 screening threshold adequately maximizes reutilization. Establish NASA-wide screening procedures across the centers and a process for monitoring implementation to maximize reutilization of controlled equipment.
- Establish NASA-wide procedures for conducting and reporting the results of annual walk-through inspections to update the data in the PP&E Module to facilitate equipment reutilization and disposal, along with an oversight mechanism to ensure implementation.

Agency Comments and Our Evaluation

In written comments on a draft of this report, which are reprinted in appendix II, NASA's Deputy Administrator agreed with four of our five recommendations. NASA did not concur with our recommendation to modify the PP&E Module to capture information on the anticipated and actual usage (availability) of equipment assigned to end users at the time the equipment is accepted and provide a mechanism to ensure that this information is updated as appropriate. NASA stated that records for equipment in the PP&E Module reside within the Equipment Master

Record (EMR) module and are listed as “active.” NASA’s further stated that because NASA’s “active” equipment is now visible NASA-wide, there is no need to design and implement a separate status category for equipment listed in the EMR. Further, it stated that this current level of “active” equipment visibility provides the opportunity for programmatic, technical, and scientific experts to discuss possible reuse through loans or borrowing, coordinating through their property custodians or equipment managers.

We continue to believe that not also including information in the PP&E Module on the availability of equipment (the extent to which “active” equipment is used, or is likely to be used) will present a barrier to effective and efficient equipment reutilization. Specifically, because the module does not identify the extent to which each piece of equipment is being, or is likely to be, used, such as on a weekly or monthly basis, potential end users must perform a potentially lengthy search by contacting other equipment end users to determine the extent to which their “active” equipment is available for utilization. For some types of equipment commonly used in NASA, the potential users one would need to contact to research actual availability of equipment listed as “active” could number in the hundreds. This potentially labor-intensive research may serve as a disincentive for users to try to identify when they could share equipment rather than purchase new equipment.

Moreover, as discussed in our draft, our review identified some equipment in storage that NASA listed as actively in use. In addition, the Financial Systems Integration Office’s property management systems requirements direct property management systems to capture an equipment item’s current use status.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to interested congressional committees, the NASA Administrator, and the Director of the Office of Management and Budget. The report also will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-9095 or raglands@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Susan Ragland". The signature is written in a cursive style with a long horizontal flourish at the end.

Susan Ragland
Acting Director, Financial Management and Assurance

Appendix I: Scope and Methodology

To address whether the National Aeronautics and Space Administration (NASA) has effectively (1) designed controls over steps NASA identified as key to its controlled equipment reutilization process, including equipment sent to disposal, and (2) implemented policies, controls, and processes to enhance equipment reutilization, we reviewed prior NASA's Office of Inspector General reports and independent public accountants' reports as well as our own prior reports and related recommendations. We also evaluated NASA management's responsiveness to observations and recommendations made in prior audit reports related to NASA's property management and utilization of equipment.

We evaluated the design of NASA's internal controls by reviewing and analyzing NASA equipment policy and procedural guidance¹ for equipment management, reutilization, and disposal² and comparing NASA's equipment management policy and procedural guidance to federal property management regulations and other standards, including GAO's standards for internal control.³ We also obtained and reviewed NASA equipment management policy and procedural guidance for screening existing equipment inventory; performing annual walk-through inspections; and managing, reutilizing, and disposing of equipment. To enhance our understanding of NASA's process for ensuring maximum utilization of equipment, we conducted walk-throughs at five NASA centers where our sample equipment items were assigned: Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, Langley Research Center, and Marshall Space Flight Center. We interviewed NASA officials responsible for equipment management and reutilization, including the Director of the Logistics Management Division, Logistics Management Division management analysts, asset managers, agency equipment program managers, and supply equipment management officers at headquarters and at each of the five NASA centers we visited and warehouse officials, property disposal officers, center equipment managers, center equipment screeners, property managers, property

¹National Aeronautics and Space Administration, *Equipment Management*, NASA Policy Directive (NPD) 4200.1B (rev. Jan. 23, 2006), and *Equipment Management Procedural Requirements*, NASA Procedural Requirements (NPR) 4200.1F (rev. May 19, 2008).

²National Aeronautics and Space Administration, *NASA Personal Property Disposal Policy*, NPD 4300.1B (rev. Jan. 31, 2006), and *Personal Property Disposal Procedural Requirements*, NPR 4300.1A (rev. Feb. 17, 2006).

³GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

custodians, procurement officials, equipment end users, and officials from the Office of the Chief Financial Officer.

To determine the accuracy of the equipment recorded as “active”⁴ in the NASA Equipment Management System (NEMS) database at the time we started our review, we selected a random probability sample of all equipment in NEMS, with an availability status code of “active.” We obtained data from NEMS as of September 30, 2007, and identified 299,386 equipment items with availability status code “A” or “active,” representing the sample universe. Based on previous audit work regarding the reliability assessment of NASA’s accounting and property data,⁵ we determined if inactive equipment was erroneously coded as active in NEMS. We tested the random probability sample of 160 transactions, from five NASA centers, from the population of transactions with the availability status code “A” to determine the accuracy of the recorded availability status code. NASA implemented its new Property, Plant, and Equipment (PP&E) Module on May 19, 2008. To ensure that the sample transactions we extracted from the legacy system were transferred and recorded in the PP&E Module, we traced each sample item to the PP&E Module, and verified that the sample transactions were transferred and recorded in the module. However, we did not determine whether all legacy system transactions were recorded in the PP&E Module, nor did we review or assess whether NASA followed best practices in designing and implementing the PP&E Module.

We selected a two-stage cluster sample with probability proportional to size with replacement at the first stage of selection. At the first stage, we selected eight NASA centers (clusters) with the probabilities of selection being proportional to the number of pieces of equipment each center had in the database (i.e., the larger centers had a better chance of being selected in the sample). Each time a center was selected, it was returned to the sample universe and given an additional chance of being selected. Therefore, it was possible for a center to be selected more than one time in the sample. We sampled eight clusters that yielded five distinct NASA centers.

⁴Active equipment is defined as equipment used in the performance of and support of a specific requirement as part of an ongoing NASA program or project.

⁵GAO, *Property Management: Lack of Accountability and Weak Internal Controls Leave NASA Equipment Vulnerable to Loss, Theft, and Misuse*, [GAO-07-432](#) (Washington, D.C.: June 25, 2007).

At the second stage, we selected a simple random sample of 20 pieces of equipment, independently for each time a center was selected at the first stage. The total sample size of items is 160 (8 clusters of 20 items per cluster). Table 2 shows the description of the sample population and total number of sample of transactions.

Table 2: Description of the Populations and Sample Transactions

NASA center	Number of equipment items	Number of times center was selected in stage 1	Number of equipment items selected in stage 2
KSC	80,428	2	40
JSC	43,145	1	20
MSFC	40,619	1	20
GSFC	40,088	3	60
LARC	30,112	1	20
ARC	22,760	0	0
GRC	17,544	0	0
SSC	13,266	0	0
DFRC	8,193	0	0
HQ	3,231	0	0
Total	299,386	8	160

Source GAO.

Note: Kennedy Space Center (KSC); Johnson Space Center (JSC); Marshall Space Flight Center (MSFC); Goddard Space Flight Center (GSFC); Langley Research Center (LARC); Ames Research Center (ARC); John Glenn Research Center (GRC); Stennis Space Center (SSC); Dryden Flight Research Center (DFRC); and Headquarters (HQ).

Because we selected a sample of equipment, our results are estimates of the population and thus are subject to sample errors that are associated with samples of this size and type. Our confidence in the precision of the results from this sample is expressed in 95 percent confidence intervals, which are expected to include the actual results in 95 percent of the samples of this type. We used a ratio estimator to generate estimates of the proportion and the total dollar amounts associated with equipment that were inaccurate and calculated a one-sided 95 percent confidence lower bound. Based on our sample results we estimate that about 16 percent (the 95 percent confidence interval ranges from 10 to 26 percent) of the equipment with availability status code “A” in the NEMS database as of September 30, 2007, was miscoded. Further, we are 95 percent confident that this miscoded equipment represents at least 2 percent of the total dollar amount of the equipment in NEMS with availability status code “A,”

or at least \$230 million. We also traced each sample item to the PP&E Module to verify that the sample transactions were transferred and recorded in the module. However, we did not determine whether all legacy NEMS transactions were recorded in the PP&E Module.

Incomplete and inaccurate data precluded us from examining the extent to which waste and inefficiencies exist in NASA's reutilization of equipment. Lack of common data fields, missing information such as equipment's model and manufacturer, and the lack of clear and consistent descriptions prevented us from comparing fiscal year 2007 equipment purchase transactions to NASA's disposal activity; this prevented us from identifying instances and dollar values where NASA purchased new equipment rather than reutilizing available equipment.

To determine the extent to which NASA's planning and initial implementation of the new PP&E Module addressed problems and control weaknesses we identified in NASA's reutilization of equipment, we reviewed and analyzed NASA equipment management policy and procedural guidance for the PP&E Module and module implementation and planning documents, including briefings and overviews of PP&E Module requirements. We reviewed and analyzed NASA equipment management policy and procedural guidance for equipment reutilization at the five centers we visited. We also interviewed the five visited centers' PP&E Module project managers to obtain their views on the PP&E Module and its impact on equipment reutilization.

We administered a data collection instrument to obtain end users' and property custodians' views on the PP&E Module and its impact on equipment reutilization. We interviewed a total of 220 end users and property custodians who are accountable for all government-owned equipment assigned to them. We interviewed 121 end users and 99 property custodians who were responsible for the items selected in our statistical sample. We also observed equipment screeners and property disposal officials as they demonstrated the PP&E Module's equipment search, disposal, and management capabilities. In addition, we conducted physical inspections of equipment at two of the five centers visited that reported new and unused equipment in the disposal system—DSPL—at the time of our visit.

We conducted this performance audit from December 2007 through January 2009 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.

Appendix II: Comments from the National Aeronautics and Space Administration

National Aeronautics and Space Administration
Office of the Administrator
Washington, DC 20546-0001



January 16, 2009

Ms. Susan Ragland
Acting Director
Financial Management and Assurance
U. S. Government Accountability Office
Washington, DC 20548

Dear Ms. Ragland:

The National Aeronautics and Space Administration (NASA) welcomes the opportunity to comment on your draft report entitled, "NASA's Goal of Increasing Equipment Reutilization May Fall Short Without Further Efforts."

On May 19, 2008, NASA took a significant, positive step in managing its controlled personal property by implementing the NASA Property, Plant, and Equipment (PP&E) Module to improve the accountability and visibility of assets utilized by all NASA installations, programs, and projects. One note of success was referenced in a NASA Inspector General report dated September 25, 2008. The report "determined that the Integrated Asset Management (IAM)/PP&E module, as designed, and the corresponding changes in NASA's business processes and controls should help mitigate deficiencies reported as material weaknesses."

In the January 2009 draft report, the Government Accountability Office (GAO) makes five recommendations to the NASA Administrator to enhance comprehensive and consistent equipment reutilization: (It should be noted that the supporting surveys and sampling done by GAO during this review were conducted during the initial deployment of the NASA PP&E System implementation and stabilization phases. Therefore, definitive conclusions and findings within the report may be premature.)

Recommendation 1: Develop and implement specific guidance, establish a mechanism to oversee implementation, and provide the necessary training to assist NASA employees and contractors in how to provide clear, consistent, and accurate equipment descriptions and key information in the PP&E Module, including the physical condition (usability). NASA management should determine the extent to which it is cost effective to apply this new guidance retroactively.

Response: Concur. NASA currently utilizes the Federal Cataloging standard for item naming for all controlled property. NASA is in full compliance with current Federal regulations and applies the same naming conventions as other Federal Agencies. Within NASA, the Center Equipment Managers are responsible for interpreting the Federal Catalog H2 Series when creating new equipment records and maintaining consistency with naming conventions. The NASA PP&E System allows for a complete

name search or partial "wild-card" search of available active equipment to enhance potential reuse. NASA's current policy, as provided in the interim NASA Procedural Requirements (NPR) 4200.1F entitled "NASA Equipment Management Procedural Requirements," was issued in May 2008 to assist NASA users with this search capability.

NASA acknowledges that further improvements may be realized through the consolidation of current decentralized Center processes into a single Agency cataloging operation. To further enhance data quality assurance and standardization, NASA will determine the feasibility of consolidating asset cataloging at one central location for new equipment and separately consider retroactive data cleansing for existing NASA-controlled property. NASA anticipates that completion of this task may be heavily impacted by resource availability.

Recommendation 2: Modify the PP&E Modules to capture information on the anticipated and actual usage (availability) of equipment assigned to end users at the time the equipment is accepted and provide a mechanism to ensure this information is updated as appropriate.

Response: Non-Concur. The PP&E Module was designed and developed by evaluating the total business process for property management and equipment accountability. As a result, two modules of the NASA PP&E system were designed to accurately manage property.

All active records reside in the Equipment Master Record (EMR) module. At no time should equipment in the EMR depict any status other than ACTIVE. Thus, there is no need to design a separate status category for the EMR. Active equipment is visible Agency wide. This visibility provides the opportunity for programmatic, technical, and scientific experts to discuss possible reuse through loans or borrowing, coordinating through their property custodians or equipment managers.

After property is declared excess, it becomes eligible for reutilization. All excess property is processed through NASA's disposition module. Equipment no longer required for performance of a specific NASA requirement will be reported for reutilization screening throughout NASA. This is accomplished when an item is declared EXCESS. Declaration of excess can be made at any time or as the result of an annual walk-through.

The culmination of years of process reengineering and best practice assessments from both commercial and private sector entities resulted in a property system that achieved the goal of increasing property accountability and the accurate valuation of controlled property across the Agency. A resultant benefit is the heightened potential for property reutilization through Agency-wide visibility and accessibility to all NASA users. This was not previously available through the legacy system.

NASA plans to utilize its Performance Measurement Plan to monitor the Module's performance with regard to asset reutilization and other key processes and will make the

See the Agency Comments
and Our Evaluation section
of this report.

necessary continuous process improvement changes to policy, processes, and/or systems, as warranted.

Recommendation 3: Provide incentives so that end users recognize the benefits of reutilizing equipment and encourage them to fully use the PP&E Module to identify potential matches and negotiate with the other users to help NASA increase equipment reutilization.

Response: Concur. Under a cost-constrained budget, NASA remains dedicated to cutting costs for the American taxpayer. NASA programs and projects are focused on cost savings Agency wide as the greatest incentive to leverage equipment reutilization. In fact, to date, the Constellation program is actively reviewing property reutilization opportunities from the Shuttle program. Early estimates are that nearly 500,000 line items of property will be directly transferred and reutilized by the Constellation program to offset acquisition costs.

As part of this property awareness campaign, NASA has reinforced efforts to achieve equipment reutilization. NASA has just revised a property management video to align with the IAM/PP&E May 2008 launch date. This video stresses the importance of property accountability and the day-to-day management of NASA property. The video also introduces the Module's ability to provide visibility of total property assets and directs the end user to *contact the appropriate property official* (property custodian, property disposal officer, and supply and equipment manager [SEMO]) for all actions pertaining to property accountability. The video is part of the official Agency training educational system.

In accordance with NASA policy, during the annual walk-through, all property identified as inactive or no longer needed becomes available for reuse or is identified as excess property to the program and enters NASA's equipment reutilization process. The new PP&E system separates utilizations into two categories. The first captures property reutilizations (as a borrow within NASA or inter-Center transfer) prior to the property being declared excess. The second category occurs after the property is declared excess to the user's need. Within the Business Warehouse module of the PP&E System, NASA can track real-time data for transfers for NASA internal programmatic reuse, transfers to other Federal agencies, and donations to eligible non-Federal recipients. Previous to the deployment of the PP&E system, this data was tracked manually which was time consuming and lent itself to potentially inaccurate reporting.

Recommendation 4: Revise NASA equipment management policy to require end users to justify any valid program needs to purchase new equipment instead of reutilizing available equipment and consider whether the \$25,000 screening threshold adequately maximizes reutilization. Establish NASA-wide screening procedures across the Centers and a process for monitoring implementation to maximize reutilization of controlled equipment.

Response: Concur. Interim NASA NPR 4200.1, Chapter 1, Section 1.1.3.2, states that “Prior to acquisition of equipment valued at \$25,000 or more, existing equipment resources will be screened in accordance with NPR 4300.1, NASA Personal Property Disposal Procedural Requirements. Equipment valued at less than \$25,000 may be screened at the option of the purchaser or the equipment management organization, on a case-by-case basis.” Appendix F, Section F.4 of that policy also states that “before new items of equipment are procured, purchase requests which have a unit cost of \$25,000 or more must be screened to determine if the desired item, or an acceptable substitute, is available, active or excess in the Business Warehouse (BW) module in the NASA PP&E System. All Center procurement requests for items of equipment with an estimated unit cost of \$25,000 or more will be routed through the Center Equipment Manager for screening, or the SEMO will coordinate with their Center procurement office where the Procurement Specialist has access to BW to accomplish the screening.”

NASA agrees to review existing Agency policies on the screening threshold for property acquisition to ensure that integration between procurement, logistics, and financial functions is in place and current.

Recommendation 5: Establish NASA-wide procedures for conducting and reporting the results of annual walk-through inspections to update the data in the PP&E Module to facilitate equipment reutilization and disposal, along with an oversight mechanism to ensure implementation.

Response: Concur. NASA already has an established policy (interim NPR 4200 1, Chapter 1, Section 1.6.1) for conducting annual walk-through inspections at both the Agency and Installation levels. The policy states that NASA Division Directors or equivalent “shall perform annual walk through inspections to ensure that equipment assigned to the organization is classified in the appropriate use status. Equipment no longer required for the performance of a specific NASA requirement shall be declared excess by using proper documentation and forwarded to the property Disposal Officer.”

Further, interim NPR 4200 1, Chapter 3, Section 3.6.5 states “walk-through inspections are required by the Federal Property Management Regulation, Section 101-43.101 and 40 U.S.C., Section 524(a) (2) and shall be performed by each Division Director or designee, *accompanied by the property custodian.*” The walk-through inspection includes all locations both onsite and offsite for each property management area, identifying inactive or underused equipment that is no longer required or that is expected to become inactive in the near future. NASA policy also states that the SEMO shall prepare a report annually for the Center Director describing the walk-through program and results.

As the policy above validates, property declared excess will be updated in the PP&E DSPL system by the property disposal officer or the property custodian for disposition and reutilization within NASA or the Federal Government.

Additionally, in 2008, NASA reinstated management reviews to evaluate the performance of NASA Center Logistics Operations. The goals of the Compensating Control Group in the Logistics Management Division are to ensure that:

- Programs are efficiently and effectively carried out in accordance with legislative requirements and Agency policy to achieve their strategic goals.
- Obligations and costs comply with applicable laws.
- Assets are safeguarded against fraud, waste, loss, and unauthorized use.

NASA will ensure that the annual property inspection is a priority review area in all future logistics functional management reviews.

Thank you for the opportunity to review and comment on this draft report. If you have any questions, please contact Ms. Susan Kinney, Director for Logistics, on (202) 358-0721 or at susan.kinney-1@nasa.gov.

Sincerely,



Shana Dale
Deputy Administrator

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Susan Ragland, (202) 512-9095 or raglands@gao.gov

Acknowledgments

In addition to the contact named above, the following staff members made key contributions to this report: Donald Neff, Assistant Director; James Ashley; Fannie Bivins; Yvonne Dorcas; Patrick Frey; Inna Livits; and Jean Mathew.

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