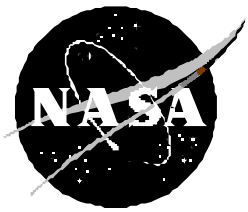
IG-99-057

AUDIT REPORT

A-76 STUDY OF NASA-3 AIRCRAFT

September 30, 1999



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Acronyms

CFR	Code of Federal Regulations
DOT	Department of Transportation
FY	Fiscal Year
GSA	General Services Administration
NPG	NASA Procedures and Guidelines
OIG	Office of Inspector General
OMB	Office of Management and Budget

W September 30, 1999

TO: J/Associate Administrator for Management Systems
M/Associate Administrator for Space Flight
DA01/Director, Marshall Space Flight Center

FROM: W/Assistant Inspector General for Auditing

SUBJECT: Final Report on Audit of A-76 Study of NASA-3 Aircraft
Assignment Number A9904300
Report Number IG-99-057

The subject final report is provided for your use and comments. Please refer to the Executive Summary for the overall audit results. Our evaluation of your response is incorporated into the body of the report and Appendix D. We request that management reconsider its position and submit additional comments by November 1, 1999. The recommendations will remain open for reporting purposes.

If you have questions concerning the report, please contact Mr. Lee T. Ball, Deputy Assistant Inspector General for Auditing, at (757) 864-3269, or Mr. James W. Geith, Auditor-in-Charge, at (301) 286-7943. We appreciate the courtesies extended to the audit staff. The final report distribution is in Appendix E.

[original signed by]

Russell A. Rau

Enclosure

cc:
B/Chief Financial Officer
B/Comptroller
BF/Director, Financial Management Division
G/General Counsel
JM/Director, Management Assessment Division

bcc:
AIGA, IG, Reading Chrons
JP/Director, Aircraft Management Office
W/Lee T. Ball
W/Jim Geith
MSFC/AD40/Director, Logistics Services Office
MSFC/RS40/Audit Liaison Representative

Contents

NASA Office of Inspector General

IG-99-057 **September 30, 1999**
A9904300

A-76 Study of NASA-3 Aircraft

Executive Summary

Background. Office of Management and Budget (OMB) Circular No. A-126, "Improving the Management and Use of Government Aircraft," May 22, 1992, requires that Federal agencies periodically review the cost-effectiveness of their aircraft operations in accordance with the requirements of OMB Circular No. A-76, "Performance of Commercial Activities," August 4, 1983. NASA owns and operates a fleet of six mission management aircraft that are used to transport personnel and equipment. NASA-3 is one of the aircraft. Office of Inspector General (OIG) Audit Report No. LA-95-001, "NASA Aircraft Management," March 28, 1995, recommended that NASA perform the cost-effectiveness analyses required by Circular No. A-76 to justify retention of the mission management aircraft. Any aircraft that cannot be operated at a cost equal to or less than the cost of using commercial airlines or aircraft services should be disposed of or released for other use. Management responded that NASA Centers would perform A-76 studies that included use of commercial carriers. NASA management intended to use the A-76 study results on the NASA-3 aircraft as the basis for closing the remaining recommendation in Audit Report No. LA-95-001.[1]

Objectives. The overall audit objective was to determine the adequacy of Marshall's A-76 study on the NASA-3 mission management aircraft. Specifically, we determined:

- whether the information Marshall used in the study and the study results were reasonable;
- whether Marshall adequately followed OMB Circular No. A-76 when it prepared the study; and
- whether using commercial airlines is a cost-effective alternative to using a Government-owned, contractor-operated aircraft.

Details on our objectives, scope, and methodology are in Appendix A.

During the audit, we learned that NASA was developing plans to replace several of the mission management aircraft, including the NASA-3 aircraft. We conducted a limited review to determine whether NASA had completed the necessary A-76 studies.

[1]George C. Marshall Space Flight Center (Marshall) prepared the A-76 study.

Results of Audit. Marshall personnel exercised care in collecting and analyzing the cost information used in the A-76 study. However, Agency use of the NASA-3 aircraft to transport personnel and equipment did not qualify as one of the purposes for which Federal policies authorize agencies to own or lease aircraft (see Finding A).

As a result of advice from the General Services Administration (GSA), Marshall did not evaluate the use of commercial airlines. Consequently, Marshall's A-76 study did not comply with OMB Circulars A-76 and A-126 or meet the intent of the 1995 audit recommendation. We estimated that the costs for using commercial airlines is $623,000 less than the costs for operating the NASA-3 aircraft during the first year of Marshall's A-76 study and $2.9 million (current dollars) less over the 5-year period covered by the A-76 study. NASA was evaluating a plan to replace three mission management aircraft, including the NASA-3 aircraft, and to upgrade a fourth aircraft. Management had not yet performed an A-76 study supporting the proposed aircraft purchase and upgrade, which would cost $43.9 million. Since these aircraft also do not meet the criteria for agencies to own or lease aircraft, NASA can avoid the $43.9 million dollar cost by using commercial airlines (see Finding B).

Recommendations. NASA management should dispose of the NASA-3 aircraft and use commercial airlines to satisfy Marshall's transportation requirements, revise Agency policy to conform with OMB requirements, evaluate commercial airlines and other aviation services when conducting A-76 studies for aircraft, and terminate plans to replace the existing mission management aircraft.

Management's Response. Management nonconcurred with the recommendations to dispose of the NASA-3 aircraft and use commercial airlines, to revise Agency policy to conform with OMB requirements, and to terminate plans to replace the existing mission management aircraft. Management concurred with the recommendation to evaluate commercial airlines and other aviation services when required in performing A-76 studies. However, management did not identify the specific actions to be taken. The complete text of management's response is in Appendix C.

Evaluation of Response. We request that management reconsider its position and provide additional comments on the report. We consider management's concurrence with the recommendation concerning A-76 studies to be nonresponsive because no corrective actions were identified. Management concurred with a similar recommendation in the 1995 audit report but has not taken acceptable action on that recommendation. The recommendation from our 1995 audit and all recommendations from this 1999 report remain unresolved. In addition to responding to the recommendation, management provided extensive comments on the report. Our evaluation of those comments is in Appendix D.

Introduction

We conducted this audit as a follow up to Audit Report No. LA-95-001, "NASA Aircraft Management." The report was the result of the NASA Inspector General's participation in a President's Council on Integrity and Efficiency-sponsored audit of Federal civilian agency use of Government aircraft. The report identified several areas in which NASA could improve the management and control of its aircraft fleet. For example, using commercial aircraft instead of its own aircraft to transport personnel would save NASA $5.8 million annually and produce a one-time savings of about $10.6 million from the sale of seven aircraft that were used exclusively for transporting personnel. The report recommended that NASA tighten controls over transporting personnel, perform cost-effectiveness studies to justify the retention of aircraft assets, and reevaluate the leasing of aircraft as compared to purchasing options. One (of 19) recommendation remains open that NASA perform cost-effectiveness analyses to justify retaining mission management aircraft.

NASA owns and operates six mission management aircraft that are used primarily to transport management and staff who provide direction, coordination, and oversight in support of NASA's mission. Table 1 shows the aircraft and their locations.

Table 1. Mission Management Aircraft

Name	Make/Model	Location
NASA-1	Gulfstream III	NASA Headquarters*
NASA-2	Gulfstream I	Lyndon B. Johnson Space Center
NASA-3	Gulfstream I	George C. Marshall Space Flight Center
NASA-4	Gulfstream I	John F. Kennedy Space Center
NASA-7	King Air B200	Dryden Flight Research Facility
NASA-8	King Air B200	Wallops Flight Facility

*Use of the NASA-1 aircraft is shared with the Federal Aviation Administration.

Findings and Recommendations

Finding A. Ownership of the NASA-3 Aircraft

Marshall primarily uses the NASA-3 aircraft to transport personnel and to occasionally transport cargo. NASA management interpreted the definition of mission requirements in Federal regulations to include the transport of personnel to activities that support the conduct of an Agency project. As a result, NASA's ownership and operation of the NASA-3 aircraft does not comply with Federal policy.

Federal Requirements for Owning Aircraft

OMB Circular No. A-76 states that air, water, and land transportation of people and things is a commercial activity, not a Government function.

OMB Circular No. A-76, "Revised Supplemental Handbook," March 1996, states:

> Agencies should rely on commercial airline or other aviation services to meet their aviation mission and transportation support needs. . . . The number of aircraft owned or leased by an agency may not exceed the number necessary to carry out direct mission requirements and, then, only where commercial operations are not as cost effective or are not available, as demonstrated by the procedures of this Supplement.

OMB Circular No. A-126 and Code of Federal Regulations (CFR), Title 41, "Public Contracts and Property Management"; Chapter 101, “Federal Property Management Regulations"; Part 101-37, "Government Aviation Administration and Coordination,” July 1, 1998 (41 CFR 101-37), limit the number and size of aircraft acquired by an agency and the capacity of those aircraft to carry passengers and cargo to the level necessary to meet the agency's mission requirements. The CFR contains the following definition of mission requirements.

> Mission requirements means activities that constitute the discharge of an agency's official responsibilities. Such activities include, but are not limited to, the transport of troops and/or equipment, training, evacuation (including medical evacuation), intelligence and counter-narcotics activities, search and rescue, transportation of prisoners, use of defense attache-controlled aircraft, aeronautical research and space and science applications, and other such activities. Mission requirements do not include official travel to give speeches, to attend conferences or meetings, or to make routine site visits. Routine site visits are [considered] customary or regular travel to a location for official purposes.

The NASA Financial Management Manual, Volume 9100, "Agencywide Coding Structure," March 1999, object class code system[2] uses the OMB classifications. The object class codes

[2]Numbering system for classifying financial transactions according to types of services, articles, or other items involved, for example, personal services, supplies and materials, equipment, etc.

characterize all travel that is associated with directing, coordinating, and managing specific NASA programs and projects as site visits. The object class codes characterize travel for the direction and coordination of general management matters as information meetings.

Use of the NASA-3 Aircraft

Marshall used the NASA-3 aircraft 227 times from March 1, 1997, through February 28, 1999. Marshall used the aircraft 222 times to transport personnel to a wide variety of site visits, information meetings, and conferences and used it 5 times to transport space flight hardware. Both uses do not meet the OMB Circular No. A-126 and 41 CFR 101-37 definitions of a mission requirement.

NASA management policy supports the use of dedicated aircraft to facilitate the conduct of Agency projects. NASA Procedures and Guidelines (NPG) 7900.3A, "Aircraft Operations Management," April 8, 1999, states that mission requirements include using aircraft for transporting personnel to project meetings, flight readiness reviews, launches and landings of the Space Shuttle, and other activities directly related to approved NASA programs or projects. However, the NASA Financial Management Manual categorizes this travel as site visits, which does not constitute a mission requirement as defined by the OMB Circular and CFR.

Since Marshall did not use the NASA-3 aircraft to support a mission requirement, NASA's ownership of the NASA-3 aircraft does not comply with Federal policy. Therefore, NASA should not own the aircraft. The cost savings for disposing of the aircraft were previously identified as part of the cost savings resulting from implementation of the recommendation in Audit Report No. LA-95-001.

Recommendations, Management's Response, and Evaluation of Response

1. The Associate Administrator for Management Systems should change the definition of mission requirements in NPG 7900.3A to conform with the definitions of a mission requirement in OMB Circular No. A-126 and 41 CFR 101-37.

Management's Response. Nonconcur. Management believes there is no substantive difference among the definitions. Moreover, because GSA and OMB are in the process of revising these definitions, management believes it is more prudent to await that update. The complete text of the comments is in Appendix C.

Evaluation of Response. We request that management reconsider its position and provide additional comments on the recommendation. NASA management states that NPG 7900.3A, paragraphs 3.3.2.1. through 3.3.2.5, provide a number of examples of activities that are mission-required uses of aircraft. These examples include travel for Flight Readiness Reviews, Space Shuttle launch and landing activities, and attendance at other meetings in support of NASA projects. OMB Circular No. A-126 and 41 CFR 101-37 specifically exclude travel for the purposes in the examples from the definition of mission-required use.

2. The Marshall Center Director should dispose of the NASA-3 aircraft.

Management's Response. Nonconcur. Commercial airlines cannot effectively meet all mission requirements. The capability of NASA mission management aircraft outweighs the marginal cost savings of total reliance on commercial airlines. Decision meetings, reviews, and other mission-related events at which senior managers must be present in order to ensure cost-effective and safe operation of each of NASA's programs could not occur if those managers relied on only commercial airlines for Agency transportation needs. The Marshall aircraft is used in accordance with NASA policy guidance that is consistent with the uses specified in the OMB Circular and the regulations (see Appendix C).

Evaluation of Response. We request that management reconsider its position and provide additional comments on the recommendation. We recognize there will be some occasions when use of charter services may be necessary to satisfy time constraints. However, this does not justify the additional cost associated with operation of the NASA-3 aircraft or a dedicated charter aircraft. NASA and Marshall management consider use of aircraft to travel to meetings in support of NASA projects to be mission requirements. The combination of guidance in OMB Circular No. A-126, 41 CFR 101-37, and the NASA Financial Management Manual shows that this travel is specifically excluded from the definition of mission requirements. Thus, NASA policy and Marshall's use of the aircraft do not comply with the OMB Circular and CFR. See Appendix D for our comments on specific issues in management's response.

Finding B. Options for Air Transportation

Marshall limited the A-76 study options for satisfying its air transportation needs to the use of a dedicated aircraft. As a result of advice from GSA, Marshall did not evaluate the use of commercial airlines as one of the alternatives. Consequently, Marshall's study on the NASA-3 aircraft did not satisfy the OMB requirements for an aircraft study. NASA management was evaluating a plan for replacing some of the mission management aircraft and had not completed the necessary A-76 studies, although management stated it planned to do so. Since commercial airlines can meet NASA's transportation needs, the Agency can save $43.9 million by not replacing the aircraft.

Aircraft Cost-Effectiveness Studies

OMB Circular No. A-126 and 41 CFR 101-37 require that "agencies must comply with OMB Circular No. A-76 before purchasing, leasing, or otherwise acquiring aircraft and related services to assure that these services cannot be obtained from and operated by the private sector more cost effectively."

Circular No. A-76 identifies transportation of personnel and cargo as a commercial activity. The OMB Circular No. A-76, "Revised Supplemental Handbook," states that agencies should not limit the options for providing the required product or service or otherwise unnecessarily restrict private sector participation.

Previous NASA OIG Recommendation

Recommendation 1 of the 1995 OIG audit report (LA-95-001) states:

> The Associate Administrators for all Headquarters program offices which operate mission management aircraft should perform the cost effectiveness analyses required by OMB Circular A-76 to justify retention of these aviation assets. Any aircraft that cannot be operated at a cost equal to, or less than, the cost of using commercial airlines or aircraft services should be released for other use or disposed.

In response to the recommendation, NASA management stated:

> An AMO [Aircraft Management Office] letter of June 27, 1994, directed each Center with Mission Management Aircraft (MMA) to conduct an A-76 study to validate the continued need for MMA and to determine the cost effectiveness of their MMA operations. Further clarification followed in a letter dated July 14, 1994, directing the Centers to evaluate the costs associated with eliminating the MMA operations and using strictly commercial carriers, substituting charter operation for the existing operation, and comparing these costs with the existing operation.

The Centers prepared studies. However, the studies were inadequate. Two studies did not include a comparison with commercial airlines, two studies used unreasonable costs, and no documentation could be found for another study.

Air Transportation Options

Commercial airlines and other aviation services provide the same service that the NASA-3 aircraft provided, that is, transportation of personnel and cargo. During the study, Marshall and the Aircraft Management Office discussed the performance of A-76 studies with other agencies. As a result of those discussions, the Aircraft Management Office determined that only two options had to be studied and provided that direction to Marshall. The two options were use of a Government-owned, contractor-operated aircraft and use of a contractor-owned, contractor - operated aircraft. Consequently, Marshall limited the study to those two options and included a requirement for a dedicated aircraft in the Performance Work Statement section of the study. The Performance Work Statement describes what is being requested, the performance standards and measures, and time frames required.

Commercial Airlines Cost Estimate

We estimated that NASA could realize significant savings by using commercial airlines instead of the NASA-3 aircraft. We compared the cost of using commercial airlines with Marshall's study cost of operating the NASA-3 aircraft. We developed the commercial airline costs using cost estimates that Marshall prepared to justify the NASA-3 aircraft trips from March 1, 1997, through February 28, 1999. Five components make up the costs for commercial airlines: airfare, salary costs for the additional time needed to travel using commercial airlines, additional per diem costs, additional rental car costs, and other costs.

We adjusted the travelers' salary costs by using the appropriate NASA fringe benefit rate for fiscal years (FY's) 1997, 1998, and 1999 instead of the 2.5 executive multiplier[3] that Marshall had used. We also adjusted the airfare, salary, and per diem costs for the actual number of people who used the aircraft instead of the planned number that Marshall used in the initial cost estimates. The Marshall A-76 study showed the estimated cost of operating the NASA-3 aircraft during FY 1999 was $1.7 million. Our estimated commercial airline cost was $956,000. Marshall estimated that terminating the hangar lease at Huntsville International Airport would cost $625,000, or $125,000 annually. After we subtracted the lease termination cost, the savings from using commercial airlines totaled $623,000 (see Table B-3, Appendix B.). The estimated savings from using commercial airlines for the 5-year period of the A-76 study cost totaled $2.9 million (current dollars).

[3]OMB Circular A-126 limits the salary costs to the gross hourly rates and fringe benefits for the travelers. The salary cost is calculated by multiplying the hourly salary cost for the travelers times the number of additional travel hours needed times the fringe benefits rate factor. NASA uses a factor of 2.5 instead of the fringe benefit rate and calls the factor the executive multiplier.

The Marshall A-76 study did not comply with OMB Circular No. A-76 and did not satisfy the recommendation from the 1995 audit report because Marshall did not evaluate the use of commercial airlines. If NASA continues to operate the NASA-3 aircraft, Marshall will spend more than necessary to satisfy its air transportation needs.

Plans for Replacing Mission Management Aircraft

During the audit, the Aircraft Management Office provided us a copy of a "Mission Management Aircraft Fleet Plan," dated June 1, 1999, that had been prepared by Conklin & de Decker Associates, Inc.[4] The plan recommends replacing three of the six mission management aircraft with four new aircraft. The three aircraft recommended for replacement are old and expensive to maintain. The plan also recommends a significant upgrade to one of the existing aircraft. The cost of the replacement aircraft and the upgrade (under a 3-year lease-to-purchase program) is $43.9 million. NASA management is evaluating the plan and has not yet made a decision on the replacement and upgrade. The plan indicates that the aircraft will be used to transport passengers.

Management stated that it has not prepared an OMB Circular No. A-76 cost analysis, but planned to do so if management decides to further pursue acquiring the aircraft. However, NASA management cannot justify the acquisition unless the aircraft will be used to meet mission requirements. In addition, an acquisition must be justified by an OMB Circular No. A-76 cost analysis that includes commercial transportation alternatives. NASA could use commercial airlines instead of purchasing new aircraft and upgrading the existing aircraft and could, therefore, put $43.9 million to better use.

Recommendations, Management's Response, and Evaluation of Response

The Associate Administrator for Management Systems should:

3. **Require the Centers to evaluate use of commercial airlines and other aviation services in performing cost-effectiveness analyses of mission management aircraft.**

Management's Response. Concur. Comparison with commercial airlines should be made on a case-by-case basis, prior to every flight, and when required in performing A-76 studies. However, we must point out that additional factors also contribute to an ultimate decision to retain or to excess aircraft (see Appendix C).

Evaluation of Response. We request that management provide additional comments on the recommendation. Management's comments are not responsive because they do not address specific actions to be taken. Management's response to the recommendation in the 1995 audit report also stated that comparisons with commercial airlines would be made. The Marshall

[4] Conklin & de Decker Associates, Inc., is an aviation research and consulting firm, which the NASA Aircraft Management Office hired to study NASA's mission management aircraft requirements and make recommendations for modernizing the existing fleet of aircraft.

A-76 study and other studies that NASA management has proposed to the OIG for closure of the recommendation did not include such a comparison. Management's interpretation of when A-76 studies are required to include a comparison with commercial airlines is inconsistent with the requirements of the Circular.

4. **Terminate all efforts to acquire new mission management aircraft and to upgrade the existing aircraft.**

Management's Response. Nonconcur. Management has not made any decisions to acquire new aircraft. It is an appropriate and fundamental tenet of responsible management that regular evaluations be performed of any activity to gauge the health and adequacy of physical resources and other areas. This includes analyzing options for modernizing organizational equipment with the objective of improving safety, effectiveness, and efficiency (see Appendix C).

Evaluation of Response. We request that management reconsider its position and provide additional comments on the recommendation. While management states that no decision has been made, it is clear that management is planning to purchase new aircraft. The Mission Management Fleet plan contains recommendations for specific aircraft to be acquired. Also, management developed "Mission Management Aircraft Review" milestones that included issuing a request for proposal, receiving and evaluating proposals, procuring aircraft, positioning the new aircraft at the Centers, and disposing of the old aircraft. There was no milestone for an A-76 study. Evaluations of how to satisfy transportation requirements should start by analyzing the full range of solutions that meet the requirements in a manner that complies with Federal laws and regulations. Limiting evaluations to solutions requiring dedicated aircraft unnecessarily restricts the alternatives. The 1995 audit report and this report identified that significant cost savings are possible from eliminating the mission management aircraft and using commercial airlines. However, NASA management should not include in their analyses alternatives that violate Federal policy.

5. **The Marshall Center Director should revise Marshall policy to require the use of commercial airlines to satisfy Marshall's air transportation requirements.**

Management's Response. Nonconcur. Marshall's current policy complies with NPG 7900.3A, OMB Circular No. A-126, and other regulations controlling the ownership and use of aircraft. It is not necessary for Marshall to revise its policy regarding the use of commercial airlines. Marshall currently uses commercial airlines for its transportation requirements as required by law. In FY 1998, 82 percent of all Marshall air travelers utilized commercial airlines (see Appendix C).

Evaluation of Response. We request that management reconsider its position and provide additional comments on the recommendation. As stated in Finding A, NPG 7900.3A and Marshall's use of the NASA-3 aircraft do not comply with Federal policy in OMB Circular No. A-126 and 41 CFR 101-37.

Appendix A. Objectives, Scope, and Methodology

Objectives

The overall objective was to determine the adequacy of Marshall Space Flight Center's study on the NASA-3 mission management aircraft as required by OMB Circular No. A-76, "Performance of Commercial Activities." Specifically, we determined whether:

- the information Marshall used in the study and the study results were reasonable;
- Marshall adequately followed OMB Circular No. A-76 when it prepared the study; and
- use of commercial airlines is a cost-effective alternative to using a Government-owned, contractor-operated aircraft.

During the audit, we learned that NASA was developing plans to replace several of the mission management aircraft, including the NASA-3 aircraft. We conducted a limited review to determine whether NASA had prepared the necessary A-76 studies.

Scope and Methodology

We obtained an overall understanding of the Federal policies governing the management and use of Government aircraft and the performance of A-76 studies. We reviewed the Marshall A-76 study for compliance with Federal policies and procedures. We assessed the reasonableness of the assumptions and cost data Marshall used. We compared the cost of operating the NASA-3 aircraft with the cost of using commercial airlines. We identified some issues we believe will improve NASA's operations.

Specifically, we:

- identified and reviewed Federal directives governing the management and use of Government aircraft and the performance of A-76 studies;
- interviewed OMB and Department of Energy personnel in order to verify our understanding of the Federal policies and procedures;
- interviewed Marshall personnel to determine how they conducted the study and their rationale for the assumptions made during the study;
- reviewed the assumptions and operations and cost data that Marshall used in the A-76 study;

- reviewed the NASA Forms 1653, "Mission Management Aircraft Request," and aircraft itineraries for the trips made using the NASA-3 aircraft from March 1, 1997, through February 28, 1999;

- prepared a cost analysis to compare the use of the NASA-3 aircraft with use of commercial airlines; and

- reviewed NASA's efforts to develop a replacement program for several mission management aircraft.

To achieve the audit objective, we extensively relied on computer-processed data contained in Marshall's A-76 study cost model. We assessed the reliability of the data including the formulas and calculations in the model and found them to be adequate. We also conducted sufficient tests of the data. As a result of the tests and assessments, we concluded that the computer-processed data are sufficiently reliable to be used in meeting the audit objectives.

Management Controls Reviewed

We reviewed NASA's compliance with guidance in OMB Circulars and the Code of Federal Regulations regarding owning aircraft and conducting A-76 studies. We identified weaknesses as discussed in Findings A and B.

Audit Field Work

We performed field work from April through July 1999 at Marshall and NASA Headquarters. We performed the audit in accordance with generally accepted government auditing standards.

Appendix B. Commercial Airline Cost Analysis

The Marshall-prepared A-76 study covered 5 FY's, 1999 through 2003. When Marshall personnel prepared the A-76 study, they assumed the aircraft would fly 600 hours per year. (The assumption was higher than the number of hours the aircraft has flown in the last 3 years--FY 1996 - 564 hours, FY 1997 - 529 hours, FY 1998 - 472 hours. The aircraft was down for 3 months in 1998 for a major inspection.)

We reviewed the NASA-3 aircraft trips made from March 1, 1997, through February 28, 1999.[5] We determined the nine locations most frequented by Marshall personnel using the NASA-3 aircraft and combined the remaining locations into a single group (see Table B-1). We then calculated the percentage of trips made to each location. For example, Marshall flew the NASA-3 aircraft to the Lyndon B. Johnson Space Center (Johnson) on 31 (13.7 percent) of the 226 trips. We used the percentages to estimate the number of flights for each location based on 600 flight hours per year.

Table B-1. Traveler's Destinations

Destination	Number of Trips	Percent of Trips
Lyndon B. Johnson Space Center	31	13.7
John F. Kennedy Space Center	41	18.1
Washington, D.C.	39	17.3
New Orleans, Louisiana	40	17.7
John C. Stennis Space Center	10	4.4
Boston, Massachusetts	7	3.1
Ogden, Utah	6	2.7
Langley Research Center	8	3.5
West Palm Beach, Florida	7	3.1
All other locations	37	16.4
Total	226	100.0

We estimated the cost of commercial airlines for the trips using the following methodology. For each location, we calculated the average cost of using commercial airlines and the average round-trip flying time. We took the cost information from the cost comparisons that Marshall prepared to justify each trip. We made two adjustments to the costs.

First, Marshall used an Executive Multiplier of 2.5 when computing the in-transient salary cost for travelers. OMB Circular No. A-126 and 41 CFR 101-37 limit in-transient salary cost to the gross hourly wages of the employee plus fringe benefits. We recalculated the in-transient salary cost using the NASA fringe benefit rates for FY's 1997 through 1999.

[5]Marshall did not prepare a commercial cost analysis for one trip. We eliminated that trip from our analysis.

Second, we adjusted the costs based on the number of people who actually used the NASA-3 aircraft. The actual number of passengers for 107 trips were different from the estimated number Marshall used to prepare the cost estimate. We did not adjust the average salary cost that Marshall used to calculate the in-transient salary cost because we did not have the necessary information. We inflated the FY's 1997 and 1998 costs to FY 1999 dollars. Then we calculated an average cost per trip for each of the 10 locations as shown in Table B-2.

Table B-2. Estimated Commercial Costs by Location
(based on FY 1999 dollars)

Location	FY 1997 Trip Costs	FY 1998 Trip Costs	FY 1999 Trip Costs	Total Trip Costs	Average Trip Costs
Lyndon B. Johnson Space Center	$81,272	$56,160	$20,287	$157,719	$5,088
John F. Kennedy Space Center	137,418	127,427	93,593	358,438	8,742
Washington, D. C.	90,242	96,746	46,861	233,849	5,996
New Orleans, Louisiana	73,330	120,410	68,617	262,357	6,560
John C. Stennis Space Center	22,616	15,072	27,699	65,387	6,539
Boston, Massachusetts	20,244	18,792	6,515	45,551	6,507
Ogden, Utah	17,308	30,761	-	48,069	8,012
Langley Research Center	10,462	33,483	15,929	59,874	7,484
West Palm Beach, Florida	-	30,003	31287	61,290	8,756
All other locations	70,050	161,986	86,856	318,892	8,619
Total	$522,942	$690,840	$397,644	$1,611,426	

We had to determine how many trips could be made if the NASA-3 aircraft was flown 600 hours. Using the flight time information, we calculated the weighted average flying time for a NASA-3 trip of 4.49 hours. We divided the weighted average flying time into 600 hours and determined 134 trips could be made during a 1-year period. We multiplied 134 times the percentage of trips to each location to estimate the number of trips NASA-3 would make to that location. For example, 18 trips could be made to Johnson (13.7 percent x 134 = 18 trips, see Table B-3).

We then multiplied the average cost per trip times the estimated number of trips to calculate the estimated cost for traveling to that location. For example, the average cost per trip to go to Johnson using commercial airlines was $5,088. The total estimated cost for 18 trips to Johnson was $91,579.[6] We totaled the estimated costs for the 10 locations. Commercial cost for FY 1999 totaled $956,083 (Table B-3).

[6]We rounded the costs to the nearest dollar in this report, which caused some rounding errors.

Table B-3. Commercial Cost Estimate for FY 1999

Location	Percent of Trips	Prorated Number of Trips	Average Commercial Cost per Trip	Total Cost
Lyndon B. Johnson Space Center	13.7	18	$5,088	$91,579
John F. Kennedy Space Center	18.1	24	8,742	209,817
Washington, D. C.	17.3	23	5,996	137,911
New Orleans, Louisiana	17.7	24	6,559	157,414
John C. Stennis Space Center	4.4	6	6,539	39,232
Boston, Massachusetts	3.1	4	6,507	26,029
Ogden, Utah	2.7	4	8,012	32,046
Langley Research Center	3.5	5	7,484	37,421
West Palm Beach, Florida	3.1	4	8,756	35,023
All other locations	16.4	22	8,619	189,611
Total	100.0	134		$956,083

Marshall A-76 study estimate for the NASA-3 aircraft operation for FY 1999	$1,703,998
Less the estimated cost of using commercial airlines	956,083
Subtotal	$747,915
Less the estimated hangar termination costs	125,000
Estimated savings from using commercial airlines	$622,915

To estimate the 5-year costs for commercial airlines, we used Marshall's A-76 cost model. We replaced the first-year costs for the contractor-owned, contractor-operated option and used the cost model to calculate the costs.

Appendix C. Management's Response

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

Reply to Attn of: J

SEP 27 1999

TO: W/Inspector General

FROM: J/Associate Administrator for Management Systems

SUBJECT: NASA RESPONSE TO OIG DRAFT REPORT A-76 STUDY OF NASA-3 ASSIGNMENT NO. A9904300

NASA must disagree with your draft report findings and recommendations. Commercial airlines simply cannot effectively meet all of our Agency mission requirements, for the reasons outlined in this letter and in the enclosed Marshall Space Flight Center (MSFC) letter. Operation of NASA's Mission Management Aircraft (MMA) is vital to the conduct of our missions. The aircraft allow us to schedule and conduct business at multiple sites, often within the course of a day or two, something impossible to accomplish when using commercial airlines. MMA provide us the capability to meet urgent requirements and to be prepared to meet contingencies associated with all of NASA's missions.

See Appendix D, OIG Comment 1.

The capability of NASA MMA outweighs the marginal cost savings of total reliance on commercial airlines. The benefits lost as a result of selecting commercial airlines over the use of MMA are non-quantifiable but irretrievable. Decision meetings, reviews, and other mission-related events at which senior managers must be present in order to ensure cost-effective and safe operation of each of NASA's programs many times could not occur if those managers relied only upon commercial airlines for Agency transportation needs. A capability for rapid transportation of senior managers is necessary to respond to program requirements and contingencies. In particular, because delays in Space Shuttle launches, especially those associated with the International Space Station, are quite costly, estimated at over one million dollars per day, the ability to rapidly transport recovery personnel and hardware to the launch site outweighs the perceived necessity to utilize only commercial air for those purposes.

See Appendix D, OIG Comment 2.

The enclosed MSFC estimates on costs refute the perceived cost savings outlined in your draft report. Your draft report utilizes costs that do not reflect the full situation. For instance, as expressed in the MSFC response, you did not recognize the value of an employee's expertise and management skills lost to the Agency while that employee is using commercial airlines.

In fact, you argued against use of an "executive multiplier." The National Business Aircraft Association (NBAA) has for many years supported the concept of a multiplier, which in NASA is expressed in the cost-comparison algorithm on each flight manifest in order to compare the cost of commercial airline travel with the cost of using Government aircraft for the same travel, and to justify the cost of each flight. At NASA, this comparison with commercial airlines is done prior to every flight, on a case-by-case basis. The NBAA study shows multipliers applied to service industries as high as 7.0 to express the cost of a senior executive's travel, and other multipliers ranging as low as 2.5 for middle management and professionals, to correct for time lost while using commercial carriers. NASA, by comparison, uses a multiplier of 2.5 times the employee's salary as an index for *all* employees to compare Government aircraft costs with commercial costs. NASA's General Counsel stated in a February 25, 1997, letter to the Associate Administrator for Management Systems and Facilities: *"NASA's use of a multiplier of 2.5 therefore appears to be both legally defensible and conservative"* [italics added].

See Appendix D, OIG Comment 2.

Although provided this information, you used a different rationale in evaluating MSFC costs. Your approach unnecessarily skewed the costs, making them appear as if the use of Government aircraft was unjustifiable. If you had utilized any form of a multiplier, your draft report would have resulted in a more balanced cost comparison of the use of the MSFC aircraft vis-à-vis commercial airlines.

See Appendix D, OIG Comment 2.

Congress recognizes and supports our transportation needs. Congressional intention and the supporting law are very clear. As late as August 3, 1999, the U.S. Congress in H.R. 2684 included provisions for these aircraft in its appropriation. In its proposed sub-appropriations for the categories of human space flight research and development activities, aeronautics and technology research and development activities, and mission support activities, the following language appears, as it has in past years' appropriations: "For necessary expenses, not otherwise provided for, in the conduct and support of [those activities] including...*purchase, lease, charter, maintenance, and operation of mission and administrative aircraft*...." Thus, it is apparent that the U.S. Congress recognizes our authority to own and operate these aircraft.

See Appendix D, OIG Comment 3.

Your draft report is erroneous in "Finding B. Options for Air Transportation," which states:

> *"Marshall limited the A-76 study options for satisfying its air transportation needs to the use of a dedicated aircraft. As a result of direction from NASA Headquarters Aircraft Management Office, Marshall did not evaluate the use of commercial airlines as one of the alternatives. Consequently, Marshall's study on the NASA-3 aircraft did not satisfy the OMB requirements for an aircraft study. NASA management was evaluating a plan for replacing some of the mission management aircraft and had not*

See Appendix D, OIG Comment 4.

Appendix C

completed the necessary A-76 studies, although management stated they planned to do so. Since commercial airlines can meet NASA's transportation needs, the Agency can save $43.9 million by not replacing aircraft" [italics added].

The NASA Aircraft Management Office arranged for General Services Administration Aircraft Management Policy Division assistance and advice on conducting A-76 studies. The GSA advice to MSFC was that the study need not include a comparison with commercial airlines if the aircraft's existence was required to perform an Agency mission. That the aircraft is required to perform the mission at MSFC is adequately attested to in the MSFC response. Further, the GSA stated that because the aircraft at MSFC was already 100 percent operated and maintained by a contractor, the completed study should be much shorter, as the basic intent of A-76 studies is to prevent Government operations from superceding commercial sector operations, when the commercial sector can adequately perform the operation. As stated in the MSFC study, theirs is not a case of a Government Owned-Government Operated aircraft competing with the commercial sector. It is a case of a Government Owned-Contractor Operated aircraft *already in compliance* with the basic intent of fostering reliance on the commercial sector.

See Appendix D, OIG Comment 4.

Further, your draft report implies that an A-76 study must be performed prior to doing even an evaluation of replacement aircraft. That is not the case. An A-76 study is required prior to *acquiring* an aircraft. NASA was, indeed, evaluating a plan to replace some MMA. However, no decision had been made -- and to date has not been made -- to do so. To explore replacement options is only normal and responsible management action, especially when 30 and 35-year-old aircraft are involved. As you know, we have also advised the Centers with MMA to perform required retention studies, and to follow the requirements of A-126 and A-76 in doing so. The MSFC study was the first; the remainder are now all scheduled to be completed by the end of this calendar year.

See Appendix D, OIG Comment 5.

Lastly, your draft report states that commercial airlines can meet NASA's transportation needs. As indicated in the MSFC letter and previously in this letter, that is simply not the case. Your draft report states that the Agency could save $43.9 million by not replacing the aircraft. The NASA evaluation of replacement aircraft indicated that the Agency could save up to 70% in operating costs over a ten-year period by replacing aged Gulfstream-1 aircraft, which were manufactured in the mid-1960's. Newer, more efficient airframes and engines, in addition to the availability of aircraft parts, are advantages in acquiring newer aircraft. We believe we need (and we intend) to continue to explore cost-effective ways to replace the older MMA with newer aircraft.

In summary, NASA must disagree with the methods, conclusions, and recommendations of your draft report. Its primary weakness is in its failure to recognize the value of opportunity

costs, those costs which would be incurred by choosing commercial airlines as a transportation alternative when NASA MMA could more effectively and efficiently accomplish the mission that NASA is required to perform. We believe that aircraft ownership is not solely about what are typically expressed as cost savings, but about the costs associated with lost opportunity. It is about accomplishing a mission that no other organization in the world can accomplish. We believe that the costs associated with the use of these aircraft are necessary costs of "doing business," of accomplishing that mission. Every year, NASA attains increasingly impressive and more frequent triumphs. And the future is bright with the hope of accomplishing even more, at even faster rates. We believe that many of those accomplishments and triumphs would not have occurred, and will not continue to occur at the rates that they have, without the use of these aircraft.

Please see Enclosures 1 and 2 for (1) a recommendation-by-recommendation response and (2) the detailed MSFC response. In view of the management determinations outlined in this letter, we now consider this as final management action for both this audit and the audit A-LA-92-013. We believe this is consistent with our previous commitments to your office.

Jeffrey E. Sutton

2 Enclosures

cc:
AI/Gen. Dailey
B/Mr. Holz
C/Mr. Christensen
G/Mr. Frankle
L/Mr. Heffernan
M/Mr. Rothenberg
R/Gen. Armstrong
S/Dr. Weiler
Y/Dr. Asrar

Appendix C

NASA's response to the OIG draft report recommendations:

Recommendation 1. The Associate Administrator for Management Systems should change the definition of mission requirements in NPG 7900.3A to conform with the definitions of a mission requirement in OMB Circular No. A-126 and 41 CFR 101-37.

NASA Response: Non-concur. We believe there is no substantive difference among the definitions. Moreover, because GSA and OMB are in the process of revising these definitions, we believe it is more prudent to await that update.

Recommendation 2. The Marshall Center Director should dispose of the NASA-3 aircraft.

NASA Response: Non-concur for the reasons stated in our letter and in Enclosure 2.

Recommendation 3. The Associate Administrator for Management Systems should require the Centers to evaluate use of commercial airlines and other aviation services in performing cost-effectiveness analyses of mission management aircraft.

NASA Response: Concur. Comparison with commercial airlines should be made on a case-by-case basis, prior to every flight, and when required in performing A-76 studies. However, we must point out that additional factors also contribute to an ultimate decision to retain or to excess aircraft.

Recommendation 4. The Associate Administrator for Management Systems should terminate all efforts to acquire new mission management aircraft and upgrade the existing aircraft.

NASA Response: Non-concur. As pointed out in our letter, we have not made any decisions to acquire new aircraft. In the meantime, however, and as we also pointed out in our letter, it is an appropriate and fundamental tenet of responsible management that regular evaluations be performed of any activity to gauge the health and adequacy of physical resources, as well as other areas. This includes analyzing options for modernizing organizational equipment with the objective of improving safety, effectiveness, and efficiency.

Recommendation 5. The Marshall Center Director should revise Marshall policy to require the use of commercial airlines to satisfy Marshall's air transportation requirements.

NASA Response: Non-concur for the reasons stated in our letter and in Enclosure 2.

Enclosure 1

MSFC RESPONSE TO THE OIG DRAFT REPORT ON A-76 STUDY OF NASA-3, ASSIGNMENT NO. A9904300

SUMMARY:

The Marshall Space Flight Center (MSFC) disagrees with the OIG's report findings and recommendations. The OIG contends that MSFC's A-76 study did not comply with OMB Circulars A-76 and A-126 since a comparison of our current cost of operations to commercial airline costs was not included. We disagree with this assertion since we believe commercial airlines cannot meet our mission requirements. Therefore, it was not a requirement to evaluate that option. NASA-3 is vital to our mission. It provides us with the ability to: 1) schedule and conduct business at multiple sites during a short period of time, 2) address the negative schedule impact and availability that plague commercial carriers; and 3) provide an aircraft to respond to emergency needs. Without this flexibility, it would be impossible for us to accomplish our mission.

GENERAL COMMENTS:

As stated in the OIG's report, the Code of Federal Regulation (CFR) defines mission requirements as *activities that constitute the discharge of an agency's official responsibilities. Such activities include, but are not limited to, ...aeronautical research and space and science applications and other such activities.* MSFC interprets the types of examples referred to in this document to be within the intent of the CFR.

There are opportunity costs that must be taken into consideration when considering the Mission Management Aircraft (MMA) option. Opportunity costs are the benefits foregone as a result of selecting one alternative over another. Generally, opportunity costs are not included in cost analyses. However, the use of opportunity cost is a practical means of reducing the alternatives under consideration. Maintaining the MSFC aircraft contains several enhancing features that rate its mission suitability as excellent, which benefits the Government. This includes the provision to schedule flights to areas not routinely serviced by commercial carriers, e.g., Michoud Assembly Facility, Kennedy Space Center, Langley Research Center, etc. In addition, the ability to provide an aircraft to respond to MSFC's emergency needs without the risk of external forces impacting and prohibiting access to flight services. In case of a Shuttle emergency that could potentially delay the launch, the appropriate emergency response team can be in the air within 2 hours with the MFSC aircraft. Similarly, response to an anomaly for any of the MSFC managed projects and programs can be accomplished within the 2-hour response time.

See Appendix D, OIG Comment 6.

Commercial airlines are unable to ship extremely sensitive items. The MSFC aircraft was used to transport crystal growth experiments from the principal experimenter to KSC for integration into the Spacelab module just before launch. The experiments were returned on the MSFC aircraft, as well. Over nine million dollars had been invested into these experiments and use of commercial airlines would have been unacceptable due to the extreme handling care that is required. The International Space Station is replacing Spacelab as the site for the ongoing crystal

See Appendix D, OIG Comment 7.

Enclosure 2

Appendix C

growth experiments. They, along with new programs, will continue to rely on the MSFC aircraft for transportation to and from the launch site.

There are several other examples why the MSFC aircraft is an essential asset in fulfilling the mission assigned to MSFC. The aircraft allows the capability and flexibility for immediate response supporting the MSFC high-risk mission. MSFC has been continuously improving the safety and reliability of all their programs but the risks involved with space flight do not disappear. The aircraft exists for the potential of resolving issues in a rapid response situation. If MSFC were totally dependent on commercial airlines, there would be an increased risk of not being able to respond properly to such situations that could potentially cost the Government millions of dollars.

In addition, the OIG failed to take into account any intangible benefits that are associated with traveling on a private aircraft versus a commercial airline. For example, in determining the best value to the Government, the OIG must determine if the Mission Suitability and Past Performance of the NASA Mission Management Aircraft (MMA) outweighs the marginal cost advantage of the commercial carrier option. Based on a best-value-tradeoff analysis that takes into account mission suitability, past performance, and cost, the MMA option provides NASA with a unique opportunity to maximize the availability of senior NASA management personnel (notably the Administrator and the Center Directors) to conduct official business to meet NASA's mission objectives. For example, while on the aircraft, senior managers continue to conduct business in the form of meetings, briefings, data review, and preparation for scheduled activities. This efficient use of their time is unachievable in the usual commercial airport/airline environment.

See Appendix D, OIG Comment 8.

The MSFC aircraft also eliminates the negative schedule impact and availability that have and, are projected to continue to be a problem for commercial airline passengers. On September 5, 1999, the Huntsville Times reported that in the first six months of 1999 the number of complaints to the Department of Transportation (DOT) had doubled from all of 1998. In addition, 29% of major U.S. airline flights were late in June 1999, up 8% from the final quarter of 1998. This impact to schedule is due to overbooking practices and flight cancellations. The major carriers routinely overbook their flights, planning on a 10% to 15% no-show factor. According to DOT data, involuntary removal of ticketed passengers increased by 50% during the first quarter of 1999. Also taken into account is the high rate of delays attributed to the myriad of Air Traffic control problems. Together, these induce a high risk to the success of senior NASA management to meet extremely tight travel itineraries. The MSFC aircraft's inherent benefit to schedule control and aircraft availability minimizes the risk of wasted time for the Center Director and other senior managers to a level identified as low.

See Appendix D, OIG Comment 9.

Other intangible benefits not considered by the OIG include the increased productivity of management, scientists, and engineers while enroute on the MSFC aircraft. Planning sessions, and response plan reviews frequently occur on the MSFC aircraft. This is impossible to accomplish utilizing commercial air. For example, the Propulsion Research Center (PRC) at MSFC is an organization focused on developing fundamentally new propulsion technologies to enable dramatically lower cost, more reliable, and safer space transportation. Many of these technologies are based on use of energy sources that are many times more concentrated than

See Appendix D, OIG Comment 10.

2

those in use for space transportation today, and include fusion, anti-matter annihilation, and other concentrated sources. Much of this work is performed by PRC partners in remote test areas (e.g., Nevada Test Site and Los Alamos National Lab) due to safety and national security considerations. PRC personnel increasingly must collaborate on emerging research. These places are not conveniently serviced by commercial airlines. An increasingly dominant portion of the PRC work involves information that is highly sensitive to ITAR/EAR control. The secure and controlled environment on the MSFC aircraft allows the team members to conduct sensitive discussions. These discussions cannot be held on a commercial airliner.

When emergency situations occur at various NASA launch and test sites, quick responses are sometimes necessary to get the appropriate personnel to the location. MSFC is located in Huntsville, Alabama, which has a limited number of commercial airline flights and destinations. Arrival at most NASA launch and test sites before 10:30 AM requires departure on commercial airlines the previous day. There are no air charter operators in the Huntsville area that could provide an aircraft of suitable size and speed to accommodate MSFC's needs. Several days of planning are required to obtain air charters and the aircraft must be flown to Huntsville from other cities if those aircraft are available. The safety record, level of pilot experience, and maintenance competencies of the charter industry are also areas of concern.

See Appendix D, OIG Comment 11.

The MSFC aircraft is required to provide transportation support in cases of emergencies in accordance with the Shuttle Contingency Handbook outlining the responsibilities in the event of an emergency. "The MSFC member of the Contingency Deployment Investigation Team is appointed by the SSPO. The appointee is available for immediate deployment in case of a contingency situation."

See Appendix D, OIG Comment 12.

On September 1, 1998, a request was placed to have the MSFC aircraft available on September 4 for transporting a manual pressure equalization valve external adapter. This was flight hardware for the International Space Station and was being fabricated at MSFC to replace a non-functional part. It was hoped the part could be manufactured, tested, and delivered to the Kennedy Space Flight Center (KSC) for installation prior to the deadline for closing the payload bay. Any delay would impact the launch date. The cost of delaying a ready-to-launch vehicle has been placed at over $1M per day. The part was deemed completed at 8 PM on September 3, 1998. Quality Assurance acceptance and required paper work was finished during the night. As soon as everything was completed, the part, paperwork, and engineers departed on September 4, 1998 at 7:05 AM CDT on the MSFC aircraft and flew to the Shuttle Landing Facility at KSC, landing at 10 AM EDT. They were successful in meeting the deadline and the launch was not delayed. Using commercial airlines would have required a departure to Orlando, Florida, on September 3 and a 50-minute drive to KSC. Therefore, commercial airlines would not have been an option. There was a question as to the probability of completing the work on time so use of a charter service would not have been feasible.

See Appendix D, OIG Comment 13.

On Saturday, December 12, 1998, an underground airline ruptured at the Michoud Assembly Facility (MAF) which caused a complete shutdown of the external tank production operations. Contamination of all flight hardware was suspected. An emergency response team was called to MSFC and they reviewed the engineering schematics, immediate reports of damage, and developed a resolution plan. As soon as the plan was completed on December 13, 1998, the

See Appendix D, OIG Comment 14.

Appendix C

team departed on the MSFC aircraft and arrived at MAF 1hour and 45 minutes later. Commercial service, if available, would have taken several additional hours.

See Appendix D, OIG Comment 15.

Emergency teams were repeatedly flown to and from KSC to resolve a hydrogen gas leak while the Space Shuttle was on the launch pad. The team was able to repair the problem and avoid expensive launch delays.

See Appendix D, OIG Comment 16.

MSFC disagrees with the estimated cost savings outlined in the OIG report. The OIG states that by disposing of the MSFC aircraft, a savings of 2.9 million dollars would be realized over a 5-year period comparing only airline ticket costs and the total costs of operating the aircraft. In this calculation, the OIG does not recognize the value of an employee's expertise and management skills lost to the Agency while he or she is away from MSFC for the extra time required for commercial travel. NASA has been using the multiplier of 2.5 times the employee's salary as an index to compare our costs with commercial costs. NASA began the practice several years ago in order to compare our costs with those of commercial carriers. NASA's legal department has ruled that the 2.5 multiplier appears to be both defensible and conservative. There are court decisions supporting this position (see attached memo). Additionally, the Armed Services Board of Contract Appeals (the Board) has recognized multipliers applied to the average hourly salary of employees to derive the full cost of their time, for purposes of quantifying productivity gains through the use of corporate-owned aircraft. The Board has also recognized much higher multipliers to be appropriate. When NASA's 2.5 multiplier is utilized, the OIG potential cost savings are reduced by 1.3 million dollars over the study period. If a higher multiplier were used to quantify the intangible benefits that we receive from our aircraft, then these cost savings would be further reduced or even reversed. The fact that direct flights on the MSFC aircraft can cut travel time by up to 60% requires the consideration of the value of the employees' time. The OIG figure can be reduced further by considering the close-out costs involved with ending the Government's obligation with the MSFC contractor tasked with the operation and maintenance of the aircraft. The new contract year begins October 1, 1999.

Overall, the OIG should conclude that the significant benefits associated with the MSFC aircraft outweigh the marginally lower cost of the commercial carrier option. In essence, the Government is permitted to and should be willing to accept the approximate 20% higher evaluated cost, in order to obtain the enhancing features of the MSFC aircraft along with lower performance risk. It should be realized, that in the highly competitive and fast moving world that NASA operates in and the large programs that NASA is charged to manage, that the availability of senior management personnel to be directly involved in certain onsite decision making processes is particularly valuable. The ability to meet the highly dynamic travel schedules of senior management personnel is important. Industry has shown time and again that the presence of senior management personnel at decision-making opportunities is a necessary cost of doing business. These opportunities provide for a more robust and competitive management environment. This intrinsic value to managing a large organization does not lead readily to a dollar for dollar accountability. However, the inability to perform this function would have a severe impact on the effectiveness of fully accomplishing MSFC's mission.

4

OIG Recommendation 1: The Associate Administrator for Management Systems should change the definition of mission requirements in NPG 7900.3A to conform with the definitions of a mission requirement in OMB Circular No. A-126 and 41 CFR 101-37.

MSFC Response: This recommendation is outside the control of MSFC. However, the Office of Chief Counsel notes that the definition of Mission Requirements as defined in NPG 7900.3A is essentially verbatim to the definitions of mission requirement in OMB Circular No. A-126 and 41 CFR 101-37 (see comparison below).

> *"Mission Required use is defined as the use of Government aircraft in the discharge of an agency's official responsibility. This includes, but is not limited to, space and science applications, space flight mission support and aeronautical research. Mission Required use does not include official travel to give speeches, to attend conferences or meetings, or to make routine site visits."...NPG 7900.3A §3.3.2*

> *"Mission requirements means activities that constitute the discharge of an agency's official responsibilities. Such activities include, but are not limited to ...aeronautical research and space and science applications, and other such activities. For purposes of this Circular, mission requirements do not include official travel to give speeches, to attend conferences or meetings, or to make routine site visits." OMB Circular A-126.*

> *"Mission requirements means activities that constitute the discharge of an agency's official responsibilities. Such activities include, but are not limited to...aeronautical research and space and science applications; and other such activities. Mission requirements do not include official travel to give speeches, to attend conferences or meetings, or to make routine site visits. Routine site visits are customary or regular travel to a location for official purposes." 41 CFR 101-37.1*

Because these three definitions are virtually identical, it does not appear that any corrective action is required to bring the NPG definition into conformance with the OMB or regulatory definitions.

OIG Recommendation 2: The Marshall Center Director should dispose of the NASA-3 aircraft.

MSFC Response: Nonconcur. The MSFC aircraft is used in accordance with NASA Policy Guidance that is consistent with the uses specified in the OMB Circular and the regulations. Use of the MSFC aircraft enables the Agency to conduct NASA business in a secure and private environment as we attend to our space and science applications, space flight mission support, and aeronautical mission requirements. Earlier examples were given to show the aircraft was used to

support mission requirements. As mentioned previously, the aircraft is on standby in case Emergency Response Teams are required to respond to various situations.

OIG Recommendation 3: Require the Centers to evaluate use of commercial airlines and other aviation services in performing cost-effectiveness analyses of mission management aircraft.

MSFC Response: MSFC performs a cost-effectiveness analysis between commercial airlines and our Mission Management Aircraft for every trip.

OIG Recommendation 4: Terminate all efforts to acquire new mission management aircraft and upgrade existing aircraft.

MSFC Response: Nonconcur. The operation of a 35-year old aircraft is more costly in terms of fuel use, maintenance, and spare parts availability. A newer aircraft would allow realization of savings in many areas (corrosion control, spare parts availability, engine overhaul costs, etc.) and would provide a greater margin of safety for our travelers. To the contrary, NASA should proceed as rapidly as possible to upgrade the existing fleet.

OIG Recommendation 5: The Marshall Center Director should revise Marshall policy to require the use of commercial airlines to satisfy Marshall's air transportation requirements.

MSFC Response: Nonconcur. It is MSFC's opinion that our current policy complies with NPG 7900.3A, OMB Circular A-126 and the other regulations controlling the ownership and use of aircraft. It is not necessary for MSFC to revise our policy regarding the use of commercial airlines. MSFC currently uses commercial airlines for its transportation requirements as required by law. In FY 1998, 82% of all MSFC air travelers utilized commercial airlines.

SPECIFIC COMMENTS TO THE CONTENT OF THE REPORT:

We revised pages ii and 5 of the final report to state that GSA furnished advice to NASA.

(page ii, para. 1; page 4, para 1; page 5, para 1;)
It is mentioned several times in the OIG report that as a result of directions from NASA Headquarters that MSFC did not evaluate the use of commercial airlines as one of the alternatives in our A-76 study. This is erroneous. MSFC was advised by the GSA A-76 expert not to evaluate commercial airlines as an alternative since it could not meet our needs.

6

Appendix D. OIG Comments on Management's Response

NASA and Marshall management provided the following comments in response to our draft report. Our responses to the comments are also presented.

NASA Management's Comment. The capability of NASA mission management aircraft outweighs the marginal cost savings of total reliance on commercial airlines. The benefits lost as a result of selecting commercial airlines over the use of mission management aircraft are non-quantifiable, but irretrievable. Decision meetings, reviews, and other mission-related events at which senior managers must be present in order to ensure cost-effective and safe operation of each of NASA's programs could not occur if those managers relied only on commercial airlines for Agency transportation needs. A capability for rapid transportation of senior managers is necessary to respond to program requirements and contingencies. Because delays in Space Shuttle launches, especially those associated with the International Space Station, are costly (estimated at more than $1 million dollars per day), the ability to rapidly transport recovery personnel and hardware to the launch site outweighs the perceived necessity to utilize commercial air for those purposes.

OIG Comment 1. The NASA aircraft are convenient but expensive, and their ownership involves strict compliance with regulatory requirements. We recognize there are occasions when use of charter services may be necessary to meet unique or emergency situations. However, our review of Marshall's use of the NASA-3 aircraft showed most of the travel was for meetings that had been scheduled in advance. As stated in the report, OMB Circular A-76 states that agencies may own aircraft only to carry out direct mission requirements and then only when commercial operations are not as cost-effective or not available. The Agency had not demonstrated that commercial services would not meet the transportation needs currently filled by the NASA-3 aircraft.

NASA Management's Comment. Marshall's estimates on costs refute the perceived cost savings outlined in the report. The report utilizes costs that do not reflect the full situation. For example, as expressed in the Marshall response, the report does not recognize the value of an employee's expertise and management skills lost to the Agency while that employee is using commercial airlines. In fact, the report discussion argues against use of an "executive multiplier." The National Business Aircraft Association has for many years supported the concept of a multiplier, which NASA expresses in the cost-comparison algorithm on each flight manifest in order to show the comparison of the cost of commercial airline travel to the cost of using Government aircraft for the same travel and to justify the cost of each flight. At NASA, this comparison with commercial airlines is done prior to every flight, on a case-by-case basis. The National Business Aircraft Association shows multipliers applied to service industries as high as 7.0 to express the cost of a senior executive's travel and other multipliers ranging as low as 2.5 for middle management and professionals to correct for time lost while using commercial carriers. By comparison, NASA uses a multiplier of 2.5 times the employee's salary as an index for all employees to compare Government aircraft costs with commercial costs. NASA's General

Counsel stated in a February 25, 1997, letter to the Associate Administrator for Management Systems and Facilities (now the Associate Administrator for Management Systems): "NASA's use of a multiplier of 2.5 therefore appears to be both legally defensible and conservative."

Although provided this information, the auditors used a different rationale in evaluating NASA-3 costs. The audit approach unnecessarily skewed the costs, making it appear as though the use of Government aircraft was unjustifiable. If the auditors had utilized any form of multiplier, the report would have resulted in a more balanced cost comparison of the use of the Marshall aircraft as opposed to commercial airlines.

OIG Comment 2. Marshall's cost estimates do not refute our findings or estimated cost savings. Use of the "executive multiplier" is inappropriate and inconsistent with Federal policy. OMB Circular A-126 and 41 CFR 101-37 recognize the loss of an employee's services while using commercial airlines. However, the Circular and CFR limit the value of this loss to the employee's salary and fringe benefits. From March 1, 1997, through February 28, 1999, the NASA fringe benefit rate ranged from 40 percent to 46 percent of salary cost. Based on those rates, we used fringe benefit multipliers ranging from 1.40 to 1.46 in our analysis. NASA management uses a comparison to commercial standards that simply does not apply to the Federal sector. With regard to administrative aircraft, the Federal Government uses different standards than the commercial sector in recognition of the fact that public confidence is an ingredient in the stewardship of taxpayer resources. The limitations OMB places on these aircraft are consistent with fiscally conservative Government operations. Our 1995 audit reported that NASA's use of a 2.5 multiplier does not comply with OMB Circular A-126 and 41 CFR 101-37. In addition, NASA management has acknowledged that use of an executive multiplier is inappropriate. In November 1996, an internal Headquarters NASA report on the NASA-1 aircraft, another mission management aircraft, stated that the review teams ". . . did not consider the 2.5 executive multiplier factor to be valid for computation purposes. The previous NASA approach of using an executive multiplier factor is not a component of costs recognized by OMB Circular A-126 Revision 2." The 1996 report recommended using the same fringe benefit multiplier that we used.

NASA Management's Comment. Congress recognizes and supports our transportation needs. Congressional intention and the supporting law are very clear. As late as August 3, 1999, the Congress included provisions for these aircraft in H.R. 2684.[7] In its proposed subappropriations for the categories of human space flight research and development activities, aeronautics and technology research and development activities, and mission support activities, the following language appears, as it has in past years' appropriations: "For necessary expenses, not otherwise

[7] Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 2000.

provided for, in the conduct and support of [those activities] including . . . purchase, lease, charter, maintenance, and operation of mission and administrative aircraft. . . ." Thus, it appears that the Congress recognizes the NASA authority to own and operate these aircraft.

OIG Comment 3. The appropriations cover the operation of all of NASA's aircraft. We are not questioning the research and development aircraft that NASA operates. Even though Congress is providing funds for aircraft operation, NASA still has an obligation to own and operate the aircraft in accordance with Federal laws and regulations.

NASA Management's Comment. Information in Finding B is erroneous. The NASA Aircraft Management Office arranged for GSA Aircraft Management Policy Division assistance and advice on conducting A-76 studies. GSA advised Marshall that the study need not include a comparison with commercial airlines if the aircraft was required to perform an Agency mission. The Marshall response adequately supports that the aircraft is required to perform the mission at Marshall. Further, the GSA stated that because the aircraft at Marshall was already 100-percent operated and maintained by a contractor, the completed study should be much shorter, because the basic intent of A-76 studies is to prevent Government operations from superceding commercial sector operations when the commercial sector can adequately perform the operation. As stated in the Marshal study, Government-owned, contractor-operated aircraft is already in compliance with the intent of fostering reliance on the commercial sector.

OIG Comment 4. The report is not erroneous. Transporting people and hardware is not an Agency mission, rather the transportation activity supports the conduct of an Agency mission. Marshall does not use the aircraft to conduct research, train NASA aircrews, or perform a mission activity. Marshall uses the aircraft only for transportation, a service that is provided by the commercial sector. Since commercial airlines are a major transportation provider, they should have been included in Marshall's A-76 analysis. We discussed Marshall's use of the NASA-3 aircraft and how A-76 studies for that aircraft should be conducted with the OMB and the same GSA official who provided the guidance to Marshall. We concluded that since Marshall used the NASA-3 aircraft only for transportation of people and hardware, Marshall should have considered use of commercial airlines as one of the A-76 study options.

NASA Management's Comment. The report implies that an A-76 study must be performed prior to doing an evaluation of replacement aircraft. This is not the case. An A-76 study is required prior to acquiring an aircraft. NASA was, indeed, evaluating a plan to replace some mission management aircraft. However, no decision had been made--and one has not been made to date. To explore replacement options is a normal and responsible management action, especially when 30- and 35-year-old aircraft are involved. Management intends to continue to explore cost-effective ways to replace the older mission management aircraft with newer aircraft.

OIG Comment 5. We agree that exploring alternatives to NASA's aging aircraft is a responsible management action. However, we disagree about the process. The process NASA should follow is the one mandated by Circular A-76. Under that process, management determines its transportation needs and then evaluates the costs and capabilities of commercial airlines, charter services, and dedicated aircraft to meet those needs. Management has determined that dedicated aircraft are needed without evaluating other, less costly, alternatives. As stated in the report, management's approach is incorrect and inconsistent with Federal policy. We are very concerned that at a time when NASA faces tight fiscal constraints, the Agency is actively evaluating the acquisition of a fleet of administrative aircraft costing $43.9 million.

Marshall Management's Comment. As stated in the report, the CFR defines mission requirements as "activities that constitute the discharge of an agency's official responsibilities. Such activities include, but are not limited to, . . . aeronautical research and space and science applications and other such activities."

There are "opportunity costs" that must be taken into consideration when considering the mission management aircraft option. Generally, 'opportunity costs" are not included in cost analyses. However, the use of opportunity cost is a practical means of reducing the alternatives under consideration. The Marshall aircraft schedule flights to areas not routinely serviced by commercial carriers, for example, Michoud Assembly Facility (Michoud), Kennedy Space Center (Kennedy), Langley Research Center (Langley), etc. In addition, the aircraft provide NASA the ability to respond to Marshall's emergency needs without the risk of external forces impacting and prohibiting access to flight services. In the case of a Space Shuttle emergency that could delay the launch, the appropriate emergency response team can be in the air within 2 hours with the Marshall aircraft. Similarly, response to an anomaly for any of the Marshall-managed projects and programs can be accomplished within the 2-hour response time.

OIG Comment 6. OMB Circular A-76 does not provide for consideration of the "opportunity costs." In addition, our review of Marshall's use of the NASA-3 aircraft during a 2-year period from March 1, 1997, through February 28, 1999, did not show travel to areas not routinely serviced by commercial carriers. Michoud is a 45-minute drive from the major New Orleans, Louisiana, airport. Kennedy is a 50-minute drive from the Orlando Airport. Langley is a 20-minute drive from the Newport News-Williamsburg International Airport and a 40-minute drive from the Norfolk, Virginia, airport. Further, technology has significantly reduced the need for an on-site presence to make executive decisions, analyze problems, and develop solutions. Information can move rapidly between locations such that the respective activities cited can, and in all likelihood are, done electronically. We recognize that senior NASA managers can be very busy. However, OMB Circular A-126 and 41 CFR 101-37 use a 24-hour period before and after the traveler's departure and arrival requirements in the determination of whether commercial airline or charter services are reasonably available. There are no special provisions for senior managers. While we are not suggesting that senior NASA managers spend up to 24 hours waiting for a commercial airline, we do not think a 50-minute drive is unreasonable on a

scheduled trip to these locations. We question the validity of the 2-hour response requirement. NASA had a 5-hour response for NASA-1, another mission management aircraft, when the aircraft was maintained and operated by a contractor. This requirement was changed to a 24-hour response when NASA signed the current Memorandum of Agreement with the Federal Aviation Administration for operation and maintenance of the NASA-1 aircraft. The aircraft request records from March 1, 1997, through February 28, 1999, showed that the NASA-3 aircraft was used once for emergency response team travel. This trip was made by the emergency response team for the Fastrac Engine Anomaly review.[8] The Mission Management Aircraft Request was dated January 29, 1999, and the travel began on February 1, 1999.

Marshall Management's Comment. Commercial airlines are unable to ship extremely sensitive items. The Marshall aircraft was used to transport crystal growth experiments from the principal experimenter to Kennedy for integration into the Spacelab module just before launch. Also, the experiments were returned on the Marshall aircraft. More than $9 million has been invested in these experiments, and use of commercial airlines would have been unacceptable due to the extreme handling care that is required. The International Space Station is replacing Spacelab as the site for the ongoing crystal growth experiments. They, along with new programs, will continue to rely on the Marshall aircraft for transportation to and from the launch site.

OIG Comment 7. This isolated use of the NASA-3 aircraft does not in and of itself exclude commercial aircraft from consideration for use by NASA. Since the experiment was safely transported on the NASA-3 aircraft, we do not understand why it could not have been transported by a charter aircraft or surface transportation.

Marshall Management's Comment. The audit failed to take into account intangible benefits that are associated with traveling on a private aircraft versus a commercial airline. For example, in determining the best value to the Government, the auditors must determine whether mission suitability and past performance of the NASA mission management aircraft outweigh the marginal cost advantage of the commercial carrier option. Based on a best value-tradeoff analysis that takes into account mission suitability, past performance, and cost, the mission management aircraft option provides NASA with a unique opportunity to maximize the availability of senior NASA management personnel (notably the Administrator and the Center Directors) to conduct official business to meet NASA's mission objectives. For example, while on the aircraft, senior managers continue to conduct business in the form of meetings, briefings, data reviews, and preparation for scheduled activities. This efficient use of their time is unachievable in the usual commercial airport/airline environment.

OIG Comment 8. OMB Circular A-76 does not provide for consideration of intangible benefits. We recognize the demands and limited time available to senior NASA management personnel.

[8] Fastrac is a turbopump rocket engine that will be used to power the X-34 and future launch vehicles. The engine is part of Marshall's Advanced Space Transportation Program and was named based on its accelerated "fast track" development schedule.

However, there are no special provisions in existing Federal regulations that authorize NASA to operate administrative aircraft for intangible or other benefits to travelers. While NASA's mission management aircraft provide flexibility and convenience, they are expensive to operate. In 1995 we reported that NASA could save $5.8 million annually by using commercial airlines instead of mission management aircraft. In the current report, we estimated that the Agency could save more than $600,000 annually by using commercial airlines instead of NASA-3. These amounts are significant, especially at a time when the Agency is facing tight fiscal constraints.

Marshall Management's Comment. The Marshall aircraft also eliminates the negative schedule impact and availability that have and are projected to continue to be a problem for commercial airline passengers. The number of complaints to the Department of Transportation (DOT) in the first 6 months of 1999 doubled from all of 1998. In addition, 29 percent of major U.S. airline flights were late in June 1999, up 8 percent from the final quarter of 1998. According to DOT data, involuntary removal of ticketed passengers increased by 50 percent during the first quarter of 1999. Together, these present a high risk to the success of senior NASA management to meet extremely tight travel itineraries. The Marshall aircraft's inherent benefit to schedule control and aircraft availability minimizes the risk of wasted time for the Center Director and other senior managers to a level identified as low.

OIG Comment 9. We recognize that delays may be encountered when using commercial airlines. However, as stated in OIG Comment 6, OMB Circular A-126 and 41 CFR 101-37 use a 24-hour period before and after the traveler's arrival and departure requirements when determining whether commercial airlines and charter services are reasonably available.

Marshall Management's Comment. The audit did not consider other intangible benefits including the increased productivity of management, scientists, and engineers while en route on the Marshall aircraft. Planning sessions and response plan reviews frequently occur on the Marshall aircraft. This is impossible to accomplish using commercial air. Much of the work performed by the Propulsion Research Center at Marshall is performed by Propulsion Research Center partners in remote test areas (for example, Nevada Test Site and Los Alamos National Laboratory) due to safety and national security considerations. The secure and controlled environment on the Marshall aircraft allows the team members to conduct sensitive discussions that cannot be held on a commercial airliner.

OIG Comment 10. As stated in OIG Comment 8, OMB Circular A-76 does not provide for consideration of intangible benefits. Also, our review of Marshall's use of the NASA-3 aircraft from March 1, 1997, through February 28,1999, did not identify any occasions when the aircraft was used to travel to the locations mentioned.

Marshall Management's Comment. When emergency situations occur at various NASA launch and test sites, quick responses are sometimes necessary to get the appropriate personnel to

the location. Marshall is in Huntsville, Alabama, which has a limited number of commercial airline

flights and destinations. Arrival at most NASA launch and test sites before 10:30 a.m. requires departure on a commercial airline the previous day. There are no air charter operators in the Huntsville area that could provide an aircraft of suitable size and speed to accommodate Marshall's needs. Several days of planning are required to obtain air charters, and the aircraft must be flown to Huntsville from other cities, if those aircraft are available. The safety record, level of pilot experience, and maintenance competencies of the charter industry are also areas of concern.

OIG Comment 11. The records of Marshall's use of the NASA-3 aircraft during the period March 1, 1997, through February 28, 1999, do not show a single use of the aircraft that was justified on the need for an immediate emergency response.

Marshall Management's Comment. The Marshall aircraft is required to provide transportation support in cases of emergencies in accordance with the Shuttle Contingency Handbook outlining the responsibilities in the event of an emergency. The Marshall member of the Contingency Deployment Investigation Team is available for immediate deployment in case of a contingency situation.

OIG Comment 12. This requirement does not preclude use of commercial airlines.

Marshall Management's Comment. On September 1, 1998, NASA placed a request to have the Marshall aircraft available on September 4 for transporting a manual pressure equalization valve external adapter. This was flight hardware for the International Space Station and was being fabricated to replace a nonfunctional part. It was hoped that the part could be manufactured, tested, and delivered to the Kennedy Space Center for installation prior to the deadline for closing the payload bay. Any delay would impact the launch date. The cost of delaying a ready-to-launch vehicle has been placed at more than $1 million per day. The part was completed at 8 p.m. on September 3, 1998. Quality Assurance acceptance and required paperwork was finished during the night. As soon as everything was completed, the part, paperwork, and engineers departed on September 4, 1998, on the Marshall aircraft and flew to the Shuttle Landing Facility at Kennedy. They were successful in meeting the deadline, and the launch was not delayed. Using commercial airlines would have meant a September 3 departure and a 50-minute drive to Kennedy. Therefore, commercial airlines would not have been an option. There was a question as to the probability of completing the work on time, so use of a charter service would not have been feasible.

OIG Comment 13. We question management's assertion that commercial airlines or charter service was not feasible. According to the Kennedy Shuttle Status Report for September 10, 1998, "Preparations are under way for tomorrow night's payload bay door closure." Since fabrication of the part was completed September 3, 1998, Marshall had several days to transport

the part to Kennedy for installation prior to the deadline for closing the payload bay on September 11, 1998. Sufficient time was available to arrange transport of the part by charter, commercial airlines, or surface transportation.

Marshall Management's Comment. On Saturday, December 12, 1998, an underground airline ruptured at the Michoud facility, causing a complete shutdown of the external tank production operations. Contamination of all flight hardware was suspected. An emergency response team was called to Marshall, and they reviewed the engineering schematics, immediate reports of damage, and developed a resolution plan. As soon as the plan was completed on December 13, the team departed on the Marshall aircraft and arrived at Michoud 1 hour and 45 minutes later. Commercial service, if available, would have taken several more hours.

OIG Comment 14. Marshall management did not identify any impact that would have resulted if the team arrived several hours later. Marshall did not document this use of the aircraft in the records we reviewed. The aircraft records show the trip was authorized to attend an Augmented Lightweight Tank Preliminary Design Review and Critical Design Review, a Long-Lead Procurement for the sixth buy of the External Tank, and a Large Structures Center of Excellence meeting.

Marshall Management's Comment. Emergency teams were repeatedly flown to and from Kennedy to resolve a hydrogen gas leak while the Space Shuttle was on the launch pad. The team was able to repair the problem and avoid expensive launch delays.

OIG Comment 15. We cannot validate this information without additional field work. The documentation we collected does not indicate the NASA-3 aircraft was used for this purpose from March 1, 1997, through February 28, 1999.

Marshall Management's Comment. Marshall disagrees with the estimated cost savings outlined in the report. The report states that disposing of the Marshall aircraft would result in a savings of $2.9 million over a 5-year period, comparing only airline ticket costs and the total costs of operating the aircraft. When NASA's 2.5 multiplier is utilized, the potential cost savings are reduced by $1.3 million over the study period. The auditors should have considered the close-out costs involved with ending the Government's obligation with the Marshall contractor who is tasked with the operation and maintenance of the aircraft which would have further reduced the savings.

OIG Comment 16. See OIG Comment 2.

Appendix E. Report Distribution

National Aeronautics and Space Administration (NASA) Headquarters

A/Administrator
AI/Associate Deputy Administrator
AO/Chief Information Officer
B/Chief Financial Officer
B/Comptroller
BF/Director, Financial Management Division
C/Associate Administrator for Headquarters Operations
G/General Counsel
J/Associate Administrator for Management Systems
JM/Director, Management Assessment Division
JP/Director, Aircraft Management Office
M/Associate Administrator for Space Flight

NASA Centers

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Director, Goddard Space Flight Center
Director, Lyndon B. Johnson Space Center
Director, John F. Kennedy Space Center
  Chief Counsel, John F. Kennedy Space Center
Director, George C. Marshall Space Flight Center
  Director, Logistics Services Office, George C. Marshall Space Flight Center
  Audit Liaison Representative, Marshall Space Flight Center

Non-NASA Federal Organizations and Individuals

Assistant to the President for Science and Technology Policy
Deputy Associate Director, Energy and Science Division, Office of Management and Budget
Branch Chief, Science and Space Programs Branch, Energy and Science Division, Office of Management and Budget
Associate Director, National Security and International Affairs Division, Defense Acquisition Issues, General Accounting Office
Professional Assistant, Senate Subcommittee on Science, Technology and Space

Appendix E

Chairman and Ranking Minority Member - Congressional Committees and Subcommittees

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

Congressional Member

Honorable Pete Sessions, U.S. House of Representatives

Major Contributors to this Report

Lee T. Ball, Deputy Assistant Inspector General for Auditing

James W. Geith, Auditor-in-Charge

Pat Reid, Program Assistant

Nancy C. Cipolla, Report Process Manager