

**AUDIT  
REPORT**

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**STAFFING OF THE EXPENDABLE LAUNCH  
VEHICLE PROGRAM OFFICE AT THE  
KENNEDY SPACE CENTER**

**February 23, 2000**

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National Aeronautics and  
Space Administration

**OFFICE OF INSPECTOR GENERAL**

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## **Acronyms**

ELV	Expendable Launch Vehicle
FMFIA	Federal Managers' Financial Integrity Act
FY	Fiscal Year
GAO	General Accounting Office
GPRA	Government Performance and Results Act
NMI	NASA Management Instruction
NPG	NASA Procedures and Guidelines
OIG	Office of Inspector General
OSF	Office of Space Flight
PCA	Program Commitment Agreement
SELVS	Small Expendable Launch Vehicle Services

W

February 23, 2000

TO: A/Administrator

FROM: W/Inspector General

SUBJECT: INFORMATION: Staffing of the Expendable Launch Vehicle Program Office at the Kennedy Space Center  
Report Number IG-00-009

The NASA Office of Inspector General has completed an audit of Staffing of the Expendable Launch Vehicle (ELV) Program Office at the Kennedy Space Center (Kennedy). We found that Kennedy adequately planned and managed the award of the Small ELV Services contracts. However, management oversight of staffing plans during and following the consolidation of the ELV Program Office to Kennedy was inadequate and will affect Kennedy's ability to meet strategic goals and may adversely affect the cost and scheduling of future Earth Science and Space Science missions.

### **Background**

On October 1, 1998, Kennedy assumed full responsibility as the Program Office for the Acquisition and Management of ELV services contracts, which includes full contract and budget authority. Kennedy managed the procurement and resulting follow-on contracts awarded on October 28, 1998. Prior to the consolidation, NASA's ELV Program had been distributed across multiple NASA Centers. This distribution of ELV Program office responsibility, prior to the consolidation, caused a number of mission-critical skills to be decentralized and duplicated among the Centers. On October 24, 1997, the Associate Administrator for the Office of Space Flight, with the concurrence of the NASA Deputy Administrator (Technical), issued a letter that authorized the establishment of a Lead Center for the Acquisition and Management of ELV Launch Services at Kennedy.

The ELV Program Office at Kennedy, provides a single focus for the acquisition and management of all ELV launch services while affording NASA the benefits of consolidated and streamlined technical and administrative functions. The reduction of program interfaces and resulting consolidation of insight of commercial launch services was intended to merge NASA technical management and enable a single organization to rebuild technical expertise and increase efficiency and effectiveness.

## **Recommendations**

We recommended that the Associate Administrator for Space Flight (1) establish clear, realistic staffing goals that align with the strategic performance goals of the ELV Program Office at Kennedy and (2) develop strategic human resources management strategies to ensure continuity of needed skills and abilities. We also recommended that the Chief Engineer incorporate in the NASA Procedures and Guidelines 7120.5A (3) a clear link between strategic performance goals and the resources that will accomplish those goals and the strategic human resources management strategies needed to ensure continuity of needed skills and abilities.

## **Management Response and OIG Evaluation**

Management concurred with the findings and recommendations. The Associate Administrator for Space Flight authorized Kennedy to hire 15 additional engineers in support of the ELV Program Office with additional hires anticipated in fiscal year 2001, pending the outcome of the ongoing budget process. The Office of Space Flight has authorized immediate additional hiring at all Office of Space Flight Centers to address workload requirements and to ensure continuity of needed skills and abilities to meet the expected increased pace of activity. The Chief Engineer agreed to make revisions to the NASA Procedures and Guidelines 7120.5A, "NASA Program and Project Management Processes and Requirements."

We consider two of the four recommendations dispositioned and closed for reporting purposes. We are monitoring recommendation three and four pending implementation of agreed-to corrective actions.

**[original signed by]**

Roberta L. Gross

Enclosure

Final Report on Audit of Staffing of the Expendable

Launch Vehicle Program Office at Kennedy Space Center

**FINAL REPORT**  
**AUDIT OF STAFFING OF THE EXPENDABLE LAUNCH**  
**VEHICLE PROGRAM OFFICE AT THE KENNEDY SPACE**  
**CENTER**

W

February 23, 2000

TO: M/Associate Administrator for Space Flight  
AE/Chief Engineer

FROM: W/Assistant Inspector General for Auditing

SUBJECT: Final Report on the Audit of Staffing of the Expendable Launch Vehicle Program Office  
at the Kennedy Space Center  
Assignment Number A9904400  
Report Number IG-00-009

The subject final report is provided for your use. Our evaluation of your response is incorporated into the body of the report. The corrective actions completed on recommendations 1 and 2 were responsive, and those recommendations are considered closed for reporting purposes. The responses to recommendations 3 and 4 are not fully responsive to the intent of our recommendation. NASA management needs to take additional corrective actions to resolve these issues, which are provided in our evaluations of your responses. Accordingly, recommendations 3 and 4 will remain open for reporting purposes pending implementation of agreed-to corrective actions. Please notify us when action has been completed on recommendations 3 and 4.

If you have questions concerning the report, please contact Mr. Daniel J. Samoviski, Program Director, Earth and Space Science Audits, at (301) 286-0497, or Ms. Esther A. Judd, Program Manager, at (301) 286-3359. We appreciate the courtesies extended to the audit staff. See Appendix G for the report distribution.

**[Original signed by]**

Russell A. Rau

cc:

B/Chief Financial Officer

B/Comptroller

BF/Director, Financial Management Division

G/General Counsel

JM/Director, Management Assessment Division

S/Associate Administrator for Space Science

Y/Associate Administrator for Earth Science

# NASA Office of Inspector General

IG-00-009  
A9904400

February 23, 2000

## Staffing of the Expendable Launch Vehicle Program Office at the Kennedy Space Center

### Introduction

The NASA Office of Inspector General (OIG) completed a survey of the Small Expendable Launch Vehicle Services. This survey was initiated to address issues identified during a previous OIG review.<sup>1</sup> The overall objective was to determine whether Kennedy Space Center (Kennedy) appropriately planned and effectively managed the Small Expendable Launch Vehicle Services (SELVS II – KSC) contract awards. In addition, we evaluated the impact of the consolidation<sup>2</sup> of the Expendable Launch Vehicle (ELV) Program at Kennedy. See Appendix A for details on our scope and methodology.

The SEVLS II – KSC procurement was to award multiple, indefinite delivery/indefinite quantity contracts to provide launch services for NASA and NASA-sponsored small class payloads.<sup>3</sup> The small class payloads generally will support the goals and objectives of NASA's Earth Science and Space Science Enterprises. NASA anticipates launching 16 missions over the 5-year period of contract performance with a total contract value not to exceed \$400 million. On October 28, 1998, Kennedy awarded contracts to Orbital Sciences Corporation (contract NAS10-99005) and Coleman Research Corporation (contract NAS10-99010). To date, NASA has issued two launch service task orders to Orbital Sciences Corporation, but no missions have been launched.

### Results in Brief

In general, Kennedy appropriately planned and effectively managed the award of the SELVS II – KSC contracts. The contracts were designed to ensure mission performance and, at this point, are meeting the customer's needs. However, management oversight of staffing plans during and following the consolidation of the ELV program to Kennedy was inadequate and will affect Kennedy's ability to meet strategic goals and may adversely affect the cost and scheduling of future Earth Science and Space Science missions.

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<sup>1</sup> The previous review was the Launch Services for Earth Science Missions (Assignment Number AHA98048), completed February 16, 1999.

<sup>2</sup> On October 1, 1998, Kennedy assumed responsibility for ELV services. This work was previously distributed across NASA as described in the Background section of the report.

<sup>3</sup> Small payloads require the entire lift capability of a Pegasus, Athena I, or Taurus rocket. The estimated payload capacity each vehicle is able to deliver into low-Earth orbit is as follows: Pegasus, 500 pounds; Athena I, 1,700 pounds; and Taurus, 3,000 pounds.



Additionally, long-term agreements between Marshall Space Flight Center (Marshall) and Kennedy for vehicle engineering have not yet been completed. See Appendix B for details on this issue.

## **Background**

On October 1, 1998, Kennedy assumed full responsibility as the Program Office for the Acquisition and Management of ELV services contracts, which includes full contract and budget authority. Kennedy managed the procurement and resulting follow-on contracts (SELVS II - KSC) awarded on October 28, 1998. Prior to the consolidation, NASA's ELV Program had been distributed across multiple NASA Centers by vehicle class<sup>4</sup> and program function. Goddard Space Flight Center (Goddard) performed the acquisition and management of Ultra-Lite, Small, Medium-Lite, and Medium class ELV launch services. Glenn Research Center (Glenn) performed the acquisition and management of Intermediate/Large class ELV launch services. Kennedy managed the NASA launch site activities for launches from Cape Canaveral Air Station, Vandenberg Air Force Base, and Wallops Flight Facility. Marshall was, and still is, responsible for vehicle engineering and insight<sup>5</sup> for development vehicles that lack a flight history. The distribution of ELV Program office responsibility prior to the consolidation caused a number of mission-critical skills to be decentralized and duplicated among the Centers. On October 24, 1997, the Associate Administrator for the Office of Space Flight, with the concurrence of the NASA Deputy Administrator (Technical), issued a letter that authorized the establishment of a Lead Center for the Acquisition and Management of ELV Launch Services at Kennedy.

The ELV Program Office at Kennedy, which was established in response to the NASA Strategic Plan, provides a single focus for the acquisition and management of all ELV launch services while affording NASA the benefits of consolidated and streamlined technical and administrative functions. The reduction of program interfaces and resulting consolidation of insight of commercial launch services was intended to merge NASA technical management and enable a single organization to rebuild technical expertise and increase efficiency and effectiveness.

## **Strategic Human Resources Management**

**Finding.** The Office of Space Flight (OSF) did not integrate strategic human resources management into the staff planning of the ELV Program Office at Kennedy. Neither the NASA strategic planning process nor NASA Procedures and Guidelines (NPG) 7120.5A, "NASA Program and Project Management Processes and Requirements," specifically addresses the use of strategic human resources management to align the staffing with the goals of the program. As a result, the ELV Program Office may be unable to meet current customer demand without the use of overtime and compensatory time. The future launch demand is expected to increase, which will affect Kennedy's ability to meet strategic goals and may adversely affect the cost and scheduling of future Earth Science and Space Science missions.

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<sup>4</sup>The classes are Ultra-Lite, Small, Medium-Lite, Medium, and Intermediate/Large.

<sup>5</sup> Insight is a process of gathering a minimum set of product or process data that provides adequate visibility into the integrity of the product or process. Insight does not constitute control or management of the process.

## **Strategic Human Resources Management is Essential**

As required by the Federal Managers' Financial Integrity Act (FMFIA) of 1982, the General Accounting Office (GAO) issued standards for internal control in government.<sup>6</sup> The standards define the minimum level of quality acceptable for internal control in government and provide the basis against which internal control is to be evaluated. GAO recognizes that effective management of human resources is essential to achieving results and is an important part of internal control. As a part of workforce planning, management should consider how best to retain valuable employees, plan for their eventual succession, and ensure continuity of needed skills and abilities.

A renewed focus on internal control was prompted by the Government Performance and Results Act (GPRA) of 1993, which requires agencies to clarify their missions, set strategic and annual performance goals, and measure and report on performance toward those goals. Internal control plays a significant role in helping managers achieve those goals.

If the government is to continue to successfully and effectively improve its operations, agency heads must make a conscious effort to integrate strategic human resources management into their agency's planning and decision-making process.<sup>7</sup>

## **NASA's Performance Plans and Guidance Lack Strategic Human Resources Management Emphasis**

NASA's Performance Plans do not show a clear linkage between its strategic goals and the human resources needed to accomplish the goals. GPRA requires a description of how goals and objectives are to be achieved, including a description of the operational processes, skills, and technology, and the human, capital, information, and other resources required to meet those goals and objectives. GAO reviewed and reported on NASA's Fiscal Year 1999 and 2000 Performance Plans<sup>8</sup> and determined that the plans complied with the requirements of GPRA, but noted that the plans could be improved by linking the strategic goals to specific resources rather than NASA's higher level presentation of identifying funding requirements by Enterprise.

NPG 7120.5A is intended to support the accomplishment of NASA's programs and projects, consistent with established Agency strategic planning. While there is a clear link between the NPG and the Strategic Plan, neither document emphasizes the link between human resources and the accomplishment of strategic goals. The focus of the NPG is delivering products on schedule, and within budget, while satisfying the requirements of multiple stakeholders and customers. NASA has no assurance that staffing is aligned with strategic goals and that the workforce is

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<sup>6</sup> GAO issued the Standards for Internal Control in the Federal Government GAO/AIMD-99-21.3.1.

<sup>7</sup> The publication on Strategic Human Resources Management: Summary Report of a Roundtable Discussion, October 22, 1998, U.S. Office of Personnel Management Office of Merit Systems Oversight and Effectiveness, provides detailed reasons for this type of integration.

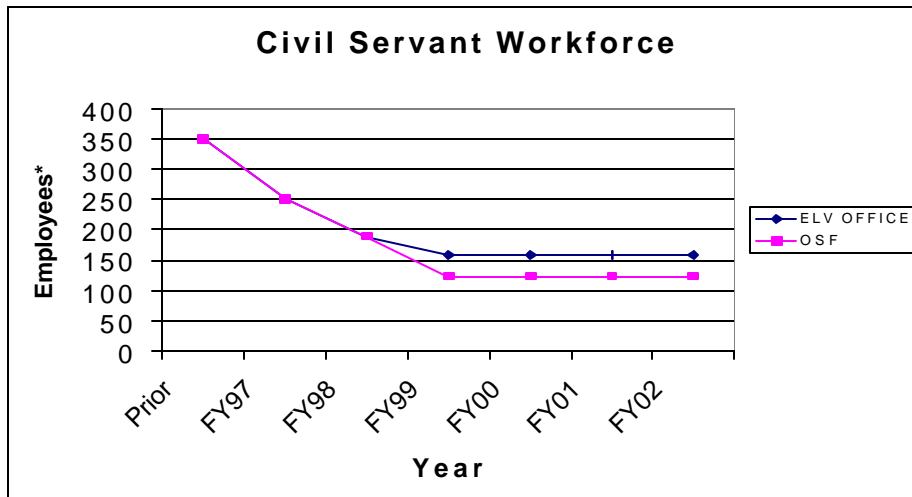
<sup>8</sup> The GAO reports were Managing for Results Observations on NASA's Fiscal Year 1999 Performance Plan, GAO/NSIAD-98-181, dated June 1998; and Observations on the NASA's Annual Performance Plan for Fiscal Year 2000 (still in draft), dated April 1999.

used appropriately and managed effectively without including strategic human resources management in its strategic planning process and in its guidance on the management of programs and projects.

### Headquarters ELV Office Staffing Assessment

The Program Management Plan assigned OSF the responsibility for defining top-level ELV Program requirements as well as program oversight, evaluation, and assessment. This responsibility includes an assessment of program implementation, program content, schedule, and changes necessary to meet requirements and available resources (see Appendix C). The OSF, in fulfilling its responsibilities, established a staffing level of 124<sup>9</sup> for the Kennedy ELV Program Office. Table 1 shows the level of actual (fiscal year (FY) 1998 and prior) and OSF projected (FY 1999 through FY 2002) civil servant support for the ELV Office.

**Table 1. Civil Servant Support for the ELV Office**



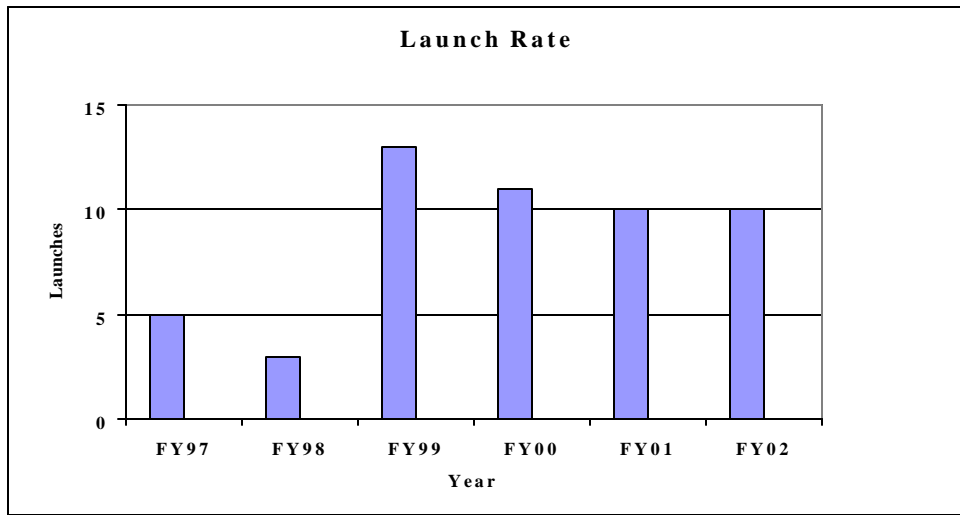
\*See footnote number 9.

The Director, ELV Requirements, NASA Headquarters, based the staffing level on 6 to 8 launches a year. The staffing level did not include missions in work.<sup>10</sup> The launch rate from 1997 to 1998 was less than 5 per year (Table 2) with 18 to 25 missions in work (Table 3). The launch rate for 1999, and beyond, is 10 or more (Table 2) and the numbers of missions in work is about 40 per year (Table 3).

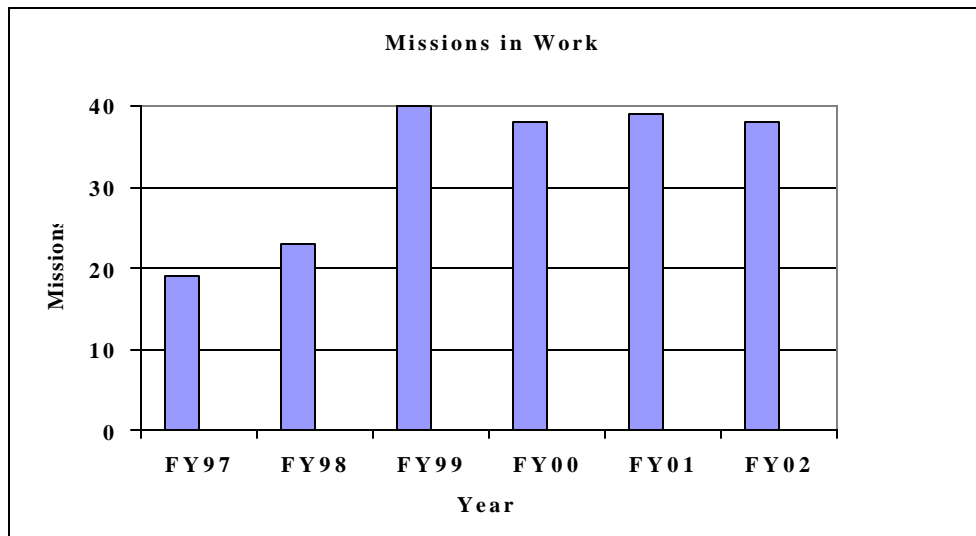
<sup>9</sup> Staffing levels are based on “full-time equivalents,” which is equal to a work-year of 2,080 hours.

<sup>10</sup> “Missions in work” refers to the 24- to 36-month lead time prior to a launch when work is being performed.

**Table 2. Launch Rate**



**Table 3. Missions in Work**



The Director's estimated staffing level also assumed a downsizing of the number of employees needed to perform the mission of the ELV Program Office based on: (1) economies of scale that have not materialized and (2) the anticipation that qualified staff would transfer from Goddard and Glenn. Less than half of the expected staff from Goddard and from Glenn transferred to Kennedy. Table 4 shows the staff that transferred from each Center.

**Table 4. Staff Transferred From Other Centers**

	From Goddard	From Glenn	From Marshall	From Other
ELV Technical	8	8	3	2
Procurement	1	1	0	0
Budget/Accounting	3	0	0	0
Totals	12	9	3	2

The staffing assessment the OSF performed does not describe how the 124 staffing level would accomplish the strategic goals of the ELV Office or discuss human resources planning issues such as the retention and recruitment of staff as discussed in the FMFIA and GPRA.

### **Kennedy ELV Program Office Staffing Assessment**

The Kennedy ELV Program Office performed a “bottoms-up” staffing assessment to (1) determine the staffing level needed to address the current launch rate/missions in work (Tables 2 and 3) and (2) meet the insight and approval requirements of NASA Management Instruction (NMI) 8610.23, “Technical Oversight of ELV Launch Services” (Appendix D). The ELV Program Office used launch experience to determine the staffing level required to meet its current launch schedule, but believes it needs an additional 20 to 25 employees to accomplish its mission and lacks lead engineers on the mission integration teams. Similar to the OSF assessment, the Kennedy ELV Program Office assessment did not consider how the staffing level would accomplish the strategic goals of the ELV Program Office or the issues of human resources planning such as retention or recruitment of staff as prescribed by the FMFIA and GPRA.

### **Impact of Not Aligning Staffing of the ELV Program with Strategic Goals**

The ELV Office is unable to meet current customer demand without the use of overtime and compensatory time, and future launch demand is expected to increase (Tables 1 and 2). If the Kennedy ELV Program Office does not align its staffing with its strategic goals, the lack of staffing could adversely impact the ELV Program’s ability to provide highly reliable, on-time, cost-effective launch services that meet or exceed customer requirements. The cost and scheduling of Earth Science and Space Science missions could also be adversely affected. In addition, the ELV Program Office will not have adequate staff to fulfill the government approval and insight requirements of NMI 8610.23 (Appendix D). The ELV Office Deputy Program Manager stated that the understaffing is not a safety concern, but that it has affected employee morale. He further stated that the fiscal year 1999 Kennedy buy-outs are expected to further deplete the number of staff with required skills and abilities. The ELV Program Office Integration Manager stated that Kennedy has already moved staff from other program areas to the ELV Office to help alleviate the staffing concerns, but that additional staff is still needed.

After the completion of our field work in August 1999, we learned that the OSF established an independent review team to assess the technical oversight process employed by the Kennedy ELV team for the *Terra Mission*<sup>11</sup> and to identify any areas that could enhance the probability of mission success. This team focused on the *Terra* launch service, but provided OSF an independent opinion on broader management issues that, in our opinion, supports our conclusion that the Kennedy ELV Program Office is not appropriately staffed to meet its current launch schedule (Appendix E).

## **Conclusion**

NASA must incorporate strategic human resource management into all aspects of strategic planning to ensure that Agency goals can be achieved. The understaffing of the Kennedy ELV Program Office is an example of the impact that human resources can have not only on the understaffed program, but also on the other NASA programs from which staff was moved to help alleviate the staffing concerns of the ELV Program Office. In addition, NASA can strengthen its Performance Plan by fully portraying how NASA's strategies and resources will help it achieve its performance goals.

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

### **The Associate Administrator for Space Flight should:**

- 1. Establish clear, realistic staffing goals that align with the strategic performance goals of the ELV Program Office at Kennedy Space Center.**

**Management's Response.** Concur. The OSF authorized Kennedy to hire 15 additional engineers in support of the ELV Program Office. An additional augmentation of as many as 14 civil service hires are anticipated in FY 2001, pending the outcome of the ongoing budget process. The complete text of management's response is contained in Appendix F.

**Evaluation of Management's Response.** Management's actions are responsive to the recommendation. The recommendation is resolved and dispositioned.

- 2. Develop strategic human resources management strategies to ensure continuity of needed skills and abilities.**

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<sup>11</sup> *Terra* is the flagship of the Earth Observing System, a series of spacecraft that represent the next landmark steps in NASA's leadership role to observe the Earth from the unique vantage point of space. Focused on key measurements identified by a consensus of U.S. and international scientists, *Terra* will enable new research into the ways that Earth's lands, oceans, air, ice, and life forms function as a total environmental system. *Terra* was launched December 18, 1999, from Vandenberg Air Force Base, California.

**Management's Response.** Concur. The OSF has authorized immediate additional hiring at all OSF Centers to address workload requirements and to ensure continuity of needed skills and abilities to meet the expected increase pace of activity.

**Evaluation of Management's Response.** Management's actions are responsive to the recommendation. The recommendation is resolved and dispositioned.

**3. The Chief Engineer should incorporate the following into the NPG 7120.5A:**

- **A clear link between strategic performance goals and the resources that will accomplish those goals.**

**Management's Response.** Concur. The Program Commitment Agreement (PCA) is the agreement between the Administrator and the Enterprise Associate Administrator that documents the Agency's commitment to execute the program requirements within established constraints. Appendix E.2 of the PCA describes NASA documentation in NPG 7120.5A that addresses this requirement.

**Evaluation of Management's Response.** Partially Responsive. Although the document described in Appendix E.2 was used by the ELV Program Office at Kennedy, the human resources needed to accomplish the goals of the program were not available. We believe that the Program Commitment Agreement should be expanded to include staffing levels/skill mixes in the cost commitments section. Recommendation 3 is resolved, but considered undispositioned pending implementation of agreed-to corrective actions.

- **The strategic human resources management strategies needed to ensure continuity of needed skills and abilities.**

**Management's Response.** Concur. The OIG should provide language, with a proposed reference location in the NPG that would address this concern. The language would be referred to the Program Project Management Working Group for consideration and disposition.

**Evaluation of Management's Response.** Partially Responsive. We believe that OSF should work with the Human Resources and Education Functional Office Leadership Plan to develop policy to implement this recommendation. This recommendation is resolved, but considered undispositioned pending implementation of agreed-to corrective actions.

## Appendix A. Objectives, Scope, and Methodology

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### Objective

The overall objective was to determine whether the SELVS II – KSC contracts were appropriately planned and managed effectively. Specifically, we determined whether:

- management oversight was adequate during and following the consolidation of the ELV Program Office at Kennedy,
- the SELVS II - KSC contracts were properly designed to ensure mission performance, and
- the SELVS II - KSC contracts are meeting the customer's needs.

### Scope and Methodology

During the survey, we reviewed the following documents:

- Transition Plan for the Lead Center for the Acquisition and Management of ELV Launch Services at the John F. Kennedy Space Center, dated January 14, 1998
- Draft Program Commitment Agreement Acquisition and Management of ELV Launch Services Mission Support, dated May 20, 1999
- Implementation Plan, dated June 19, 1998, for Transferring Medium, Medium-Lite, Small, and Ultra-Lite Class Launch Services from Goddard Space Flight Center to Kennedy Space Center,
- Transition Plan, dated July 17, 1997, for Transferring Program Management of Intermediate ELV Launch Services from Lewis Research Center to Kennedy Space Center,
- Program Management Plan, dated November 10, 1998, for the Lead Center for the Acquisition and Management of ELV Launch Services at the John F. Kennedy Space Center
- Kennedy ELV Office Staffing Plans, not dated
- Charts, dated June 15, 1999, that showed revised OSF Staffing Plans beginning on July 3, 1997
- NPG 7120.5A, NASA Program and Project Management Processes and Requirements
- NASA *Terra* Independent Assessment Team Report, June 15, 1999

During the survey, we interviewed the following personnel:

- NASA Headquarters, Kennedy, and Goddard program and contract officials.
- Orbital Sciences Corporation and Coleman Research Corporation contract officials.
- NASA Headquarters Associate General Counsel.



## **Appendix A**

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### **Management Controls Reviewed**

We reviewed the following management controls: program management plans, transition plans, implementation plans, and commitment agreements.

We considered controls adequate except for the lack of integration of strategic human resources management into the NASA planning process and the specific effects it has had and will have on the ELV Program Office at Kennedy. Details are in the finding section of the report.

### **Audit Field Work**

We performed the audit field work from April through September 1999 at NASA Headquarters, Goddard Space Flight Center, and Kennedy Space Center. We conducted the audit in accordance with generally accepted government auditing standards.

## Appendix B. Other Matters of Interest

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### Marshall Long-Term Agreements

The Transition Plan for the Lead Center for the Acquisition and Management of ELV Launch Services at the John F. Kennedy Space Center, dated January 14, 1998, establishes Marshall's responsibilities as:

- Establishing qualification criteria for NASA's acceptance of commercially available launch services to meet NASA's needs.
- Supporting procurement development team and source evaluation board activities.
- Providing launch vehicle and propulsion engineering, including necessary assessments to confirm readiness for flight.
- Development of qualification criteria for new and future launch vehicles and vehicle configurations.

The transition plan also states that Kennedy intends to have long-term agreements with Marshall for vehicle design engineering support functions. To date, Marshall and Kennedy officials have not completed long-term agreements. Although we did not identify adverse conditions that occurred due to the lack of the agreements, the ELV Program Office Program Manager should ensure that the long-term agreements are completed to fulfill the requirements of the transition plan and his responsibilities under NPG 7120.5A.

## **Appendix C. Program Management Plan**

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Section 5 Program Requirements, “Program Management Plan for the Lead Center for the Acquisition and Management of Expendable Launch Vehicle Launch Services at the John F. Kennedy Space Center (NASA Expendable Launch Vehicle Program), dated November 10, 1998,” establishes the following:

The ELV Program Office is responsible for effectively and efficiently satisfying the program requirements of NASA Headquarters operating through OSF. The Headquarters Office of Space Flight is responsible for definition of top-level program requirements and ELV Program oversight, evaluation, and assessment. This responsibility includes development, coordination, and update of top-level requirements consistent with the strategic plan and customer requirements; external advocacy for the program and broadening of the customer base; and recommendation and allocation of ELV budgets. Responsibility for program oversight, evaluation, and assessment includes assessment of program implementation, program content, schedule, and changes necessary to meet requirements and available resources. OSF also manages and provides status to the Headquarters-level Program Management Council (PMC); establishes and tracks program metrics; and chairs the ELV Flight Planning Board. The Director, ELV Requirements has been assigned these responsibilities for OSF.

The Director, ELV Requirements, OSF, addresses issues related to policy, direction, and guidance of NASA’s ELV Program. The Director, through the Flight Planning Board, approves class of service, vehicle configuration, and launch date by letter of authority. Upon receipt of the letter of authority, the ELV Program Office acquires and manages the launch services. Currently, these launch services, which are defined as projects, include Ultra-Lite, Small, Med-Lite, Medium, and Intermediate class services for launch of NASA, NASA-sponsored, and other government payloads.

## Appendix D. Required Approval and Insight

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NASA Management Instruction 8610.23, “Technical Oversight of ELV Launch Services,” establishes the following requirements:

Government Approval is required for the following specific areas:

- Spacecraft-to-launch vehicle interface control documents/drawings
- Decisions/resolutions of action items as determined by joint NASA/contractor Mission Integration working groups
- Mission-unique hardware design analysis, manufacture, and test
- Mission unique software design, analysis, and test
- System Effectiveness Plan (SEP), which shall reflect latest revisions of NASA Handbooks (NHB) 5300.4 (1A), 5300.4 (1B), and 1700.1 guidelines
- Changes to the SEP
- Top-level test plans, requirements, and success criteria for Integrated Vehicle Systems Tests and Launch Site Vehicle assembly and test
- Launch Commit Criteria
- Closeout of actions from NASA chaired Mission, Launch, and Flight readiness reviews
- Spacecraft handling procedures and deviations
- Integrated spacecraft/vehicle mate, test, and closeout procedures and deviations
- Integrated spacecraft/vehicle mate, test, and closeout as-run procedures and deviations
- Launch countdown procedures and deviations that affect spacecraft/vehicle integrated assembly
- Launch Go/No-Go

Government Insight is required for the following specific areas:

- Baseline vehicle design, analyses, and configuration management
- Production program reviews, plans, and schedules
- Production and systems test Material Review Boards
- Critical flight hardware pedigree
- Safety, Reliability, Maintainability, and Quality Assurance (SRM&QA) compliance evaluations
- Pre-ship reviews
- Design reviews
- Qualification reviews
- Major/critical problems
- Major system and integrated systems tests
- Post-test data
- Anomaly resolutions/Failure analysis
- Vehicle/ground support equipment procedures
- Launch site support work schedules and plans
- Launch site vehicle preparations and closeout data
- Vehicle walkdown inspections
- Operations and procedures discipline
- Work practices and documentation
- Conduct of contractor chaired Mission, Launch, and Flight Readiness Reviews
- Postflight vehicle, tracking, and range data
- Postflight anomaly investigations/closeouts

## Appendix E. Independent Review Team

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“NASA *Terra* Independent Assessment Team: Report to NASA Headquarters, June 15, 1999,” provided recommendations that, if implemented, will enhance the probability of launch success. Although the team focused on *Terra*, it became clear that *Terra* could not be viewed as an isolated mission. Broader management issues, although not unique to *Terra*, could affect the reliability of the *Terra* launch. These issues are associated with the ELV program transition. The Independent Assessment Teams’ observations included the following:

- The ELV staff appears not to be a high priority in terms of Kennedy management attention.
- There is an apparent lack of planning for future viability of the ELV organization.
- No succession planning exists to account for loss of critical personnel.
- The current ELV program complement is inadequate for maintaining pre-transition levels of Insight/Approval across assigned missions.
- Staff reductions are planned.
- Kennedy ELV personnel will eventually burn out, be threatened by negative personal/family consequences and, either literally or functionally, abandon the program.
- The performance level of people working under such conditions eventually declines.
- Without implementation of a staff development plan, post-transition shortfalls in experience will not be rectified.
- The near-term, inevitable attrition of current staff members will seriously degrade Kennedy’s ability to perform value-added Insight.

## Appendix F. Management's Response

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



Reply to Airtel of

MV

SEP 7 2000

**TO:** W/Assistant Inspector General for Auditing  
**FROM:** M/Associate Administrator for Space Flight  
**SUBJECT:** Draft Report on Staffing of the Expendable Launch Vehicle Program  
Office at the Kennedy Space Center (KSC)  
Assignment Number A9904400

Thank you for the opportunity to respond to the subject audit. This is a consolidated response from the Office of Space Flight and the NASA Chief Engineer. NASA agrees with the OIG conclusion on the initial subject of the audit, that Kennedy appropriately planned and effectively managed the award of the SELVS II – KSC contracts, noting that the contracts were designed to ensure mission performance and are meeting the customer's needs.

The bulk of the OIG report and recommendations address staffing allocations for ELV's following the consolidation of the ELV program at Kennedy, which was effective October 1, 1998 and state a general Agency shortfall addressing strategic human resources management strategies to ensure continuity of needed skills and abilities in the NPG 7120.5A. The NASA ELV Program is recognized as a critical function for NASA which OSF has worked with KSC to assure staffing requirements are adequate to meet mission requirements. This continues to be an evolving process as we rightsize the workforce in ELV's as well as all NASA programs within existing fiscal constraints.

A key objective of the transition of acquisition and program management to KSC was recognition by OSF that the ELV experience base at the past vehicle design centers (Glenn Research Center (GRC) for Atlas and Goddard Space Flight Center (GSFC) for Delta) was eroding since the transition to acquisition of launch services in 1987. Consolidation of this critical function at KSC, enabled the Agency to reinvigorate it's expertise as knowledgeable buyers of launch services by building on the resident KSC operational technical base through initial transfers of residual experienced staff at GSFC and GRC (total of 27 from outside KSC) and reassignments within KSC. This has proved successful in the early phase of the transition. The initial staffing objective of 124 FTE for a consolidated ELV team was arrived at through discussions between the ELV and Upper Stages Project Managers at KSC, MSFC, GSFC and GRC with the HQ ELV Director. The working assumptions used assumed a normalized flight rate of 6-8 missions a year with 15-20 missions in flow. The level of technical involvement varies

by mission, based on mission complexity/vehicle assignment, and activity prior to launch. Center unique administrative and management functions were identified by KSC in the early phases of the transition as additional requirements, as was the need for personnel to focus on documentation of ELV processes.

The manifest is a projection of planned requirements, however, actual launch schedules are driven by external factors, such as spacecraft readiness, instrument delivery, range availability, launch vehicle readiness and weather. Based on past experience, a planned manifest often sees some slippage in flight rate and often unplanned clustering of launches. For example, during the initial phase of the OIG study, the manifest reflected 10 launches in 1999, by August the manifest reflected 13 missions, which by the end of the year 10 launches were successfully conducted. Important to note that three of those 10 launches were NASA secondary payloads which require a less extensive technical involvement by KSC. What was not planned was the extensive series of internal and external vehicle reviews associated with non-NASA launch failures that placed an unplanned burden on the KSC workforce.

The OIG inquiry into staffing began 6 months after the ELV transition during a time of unprecedented launch failures and associated industry and government reviews into the cause of the failures. On May 7, 1999, after a series of non-NASA launch failures, the Director, OSF Requirements convened a Senior Management Review Team (SMRT) to assess the adequacy of NASA's current ELV Program and Technical Management. On May 18, 1999, an Independent Review Team of the Terra Launch Service was initiated by the OSF ELV Director who reported its findings to the SMRT and senior OSF/KSC management on June 15. These reviews all confirmed that the technical oversight approach was sound, and warranted additional augmentation of the KSC civil servant workforce supporting ELV's. OSF worked with KSC through the summer to identify specific skill mix shortfalls for the longer term to address these staffing issues.

Subsequently, KSC has identified critical skill gaps. KSC continues to evaluate the proper balance between civil servants and support contractors and evolve a technical oversight strategy that meets policy directive and customer requirements within resource constraints. This process will be ongoing and OSF will continue to monitor and adjust staffing allocations as warranted. Overtime and compensatory time will be a necessity to address unforeseen launch clustering, with affects being easier to manage with a larger workforce.

Following are responses to each of the four recommendations included in the audit.

Recommendation 1

The Associate Administrator for Space Flight should establish clear, realistic staffing goals that align with the strategic performance goals of the ELV Program Office at Kennedy Space Center.

We concur with this recommendation. On December 15, 1999, OSF authorized KSC to hire an additional 15 engineers in support of the ELV Program. These hires are in

addition to the 143 FTE planned in the FY 2000 budget at KSC in the ELV Program. An additional augmentation of as many as 14 civil service hires are anticipated in FY 2001, pending outcome of the ongoing budget process. KSC's FY 2000 budget has already been augmented to provide funds for additional support contractors required to enable KSC technical oversight of launch services. These staffing augmentations are consistent with KSC's bottoms up review, with a focus on augmenting the ELV engineering workforce.

#### Recommendation 2

The Associate Administrator for Space Flight should develop strategic human resources management strategies to ensure continuity of needed skills and abilities.

We concur with this recommendation. OSF has completed an assessment of Center staffing requirements as part of the Agency Core Competency Review. As a result of this review, as well as inputs from external reviews of the OSF Center's workforce, OSF has authorized immediate additional hiring at all OSF centers to address workload requirements and to ensure continuity of needed skills and abilities to meet the expected increase pace of activity. During this assessment, OSF identified KSC priorities as follows: shuttle safety of flight operations, ISS and ELV activities. OSF is working closely with the KSC Center Director to assure that these priorities are maintained and enhanced through the ongoing KSC 2000 Reorganization Plan which will focus the Center's strategy for assuring continuity of needed skills for the foreseeable future. The KSC ELV Program Manager is responsible for human resources planning issues such as the retention and recruitment of staff as discussed in the FMFIA and GPRA.

#### Recommendation 3

The Chief Engineer should incorporate the following into the NPG 7120.5A: A clear link between strategic performance goals and the resources that will accomplish those goals.

We concur with this recommendation. Appendix E.2 that describes NASA documentation in NPG 7120.5A addresses this requirement. The Program Commitment Agreement (PCA) is the agreement between the Administrator and the Enterprise Associate Administrator that documents the Agency's commitment to execute the program requirements within established constraints. Additional commitments are documented in Program and Project Plans that detail the approach and plans for formulating, approving, implementing, and evaluating programs and projects. This ensures that the Agency and all supporting organizations understand the programmatic, technical and management systems requirements and commit to providing the necessary resources.

#### Recommendation 4

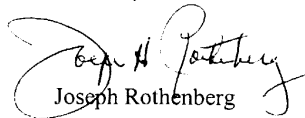
The Chief Engineer should incorporate the following into the NPG 7120.5A: The strategic human resources management strategies needed to ensure continuity of needed skills and abilities.



We concur with this recommendation, with the following clarification. The Human Resources and Education Functional Office Leadership Plan (Code F) may be better suited to address this issue. Should the OIG provide candidate language, with a proposed reference location in the NPG it feels would address this concern, the language would be referred to the Program Project Management Working Group for consideration and disposition.

Thank you again, for the opportunity to respond to the audit recommendations.

Sincerely,



Joseph Rothenberg

cc:

A/Dr. Mulville  
AE/Mr. Hudkins  
J/Mr. Sutton  
MV/Ms. Poniatowski  
KSC/Mr. Bridges  
KSC/Mr. Bruckner  
MSFC/Ms. Griner

bcc:

M/Mr. Readdy  
M-7/Mr. Starkey  
MX/Ms. Gabourel

## **Appendix G. Report Distribution**

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A/Administrator  
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AI/Associate Deputy Administrator  
B/Chief Financial Officer  
B/Comptroller  
BF/Director, Financial Management Division  
G/General Counsel  
H/Associate Administrator for Procurement  
J/Associate Administrator for Management Systems  
JM/Director, Management Assessment Division  
L/Associate Administrator for Legislative Affairs  
M/Associate Administrator for Space Flight  
S/Associate Administrator for Space Science  
Y/Associate Administrator for Earth Science

### **NASA Centers**

Director, Kennedy Space Center

### **Non-NASA Federal Organizations and Individuals**

Assistant to the President for Science and Technology Policy  
Deputy Director of Management, Office of Management and Budget  
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

### **Chairman and Ranking Minority Member - Congressional Committees and Subcommittees**

Senate Committee on Appropriations  
Senate Subcommittee on VA, HUD, and Independent Agencies

## **Appendix G**

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### **Chairman and Ranking Minority Member - Congressional Committees and Subcommittees (Cont.)**

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 Government Management, Information, and Technology

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

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**Report Title:** Final Report on the Audit of Management and Administration of International Agreements at NASA

**Report Number:**

**Report Date:**

*Circle the appropriate rating for the following statements.*

	Strongly Agree	Agree	Neutra l	Disagre e	Strongl y Disagre e	N/A
1. The report was clear, readable, and logically organized.	5	4	3	2	1	N/A
2. The report was concise and to the point.	5	4	3	2	1	N/A
3. We effectively communicated the audit objectives, scope, and methodology.	5	4	3	2	1	N/A
4. The report contained sufficient information to support the finding(s) in a balanced and objective manner.	5	4	3	2	1	N/A

*Overall, how would you rate the report?*

Excellent    Fair  
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Good

*If you have any additional comments or wish to elaborate on any of the above responses, please write them here. Use additional paper if necessary.* \_\_\_\_\_

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*How did you use the report?* \_\_\_\_\_

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*How could we improve our report?* \_\_\_\_\_

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*How would you identify yourself? (Select one)*

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NASA Employee

Private Citizen

Government: \_\_\_\_\_ Federal: \_\_\_\_\_ State: \_\_\_\_\_ Local: \_\_\_\_\_

Media

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Other: \_\_\_\_\_

*May we contact you about your comments?*

**Yes:** \_\_\_\_\_

**No:** \_\_\_\_\_

**Name:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_

Thank you for your cooperation

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