IG-00-039

AUDIT REPORT

SPACE FLIGHT OPERATIONS CONTRACT PHASE II

August 4, 2000

OFFICE OF INSPECTOR GENERAL

National Aeronautics and
Space Administration

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Acronyms

DCAA	Defense Contract Audit Agency
FAR	Federal Acquisition Regulation
FY	Fiscal Year
SFOC	Space Flight Operations Contract
USA	United Space Alliance

W August 4, 2000

TO: A/Administrator

FROM: W/Inspector General

SUBJECT: INFORMATION: Space Flight Operations Contract Phase II
Report Number IG-00-039

The NASA Office of Inspector General has completed an audit of the Space Flight Operations Contract (SFOC) Phase II. We found that NASA management of Phase II of the SFOC needs improvement. As we reported earlier, NASA did not perform a cost-benefit analysis.[1] The lack of a cost-benefit analysis precluded proper determination of contract requirements and establishment of a baseline with which to later measure accomplishment of potential cost savings and other goals. During this phase of the audit, we found that NASA cannot be assured it received fair and reasonable pricing because the fiscal year (FY) 1998 flight rate credit[2] analysis was not fully documented in the contract file in accordance with Federal Acquisition Regulation (FAR) requirements. Specifically, the SFOC file did not contain the evidence of technical, price, or cost analysis, or verification of direct and indirect rates that the contracting officer should have used to determine whether the FY 1998 flight rate credit of $33.3 million was fair and reasonable. As a result, there is no evidence that adequate technical, price, or cost analysis was performed. Consequently, NASA cannot be assured that the $33.3 million represents a full contract price[3] reduction from the two cancelled flights and, therefore, NASA may be paying more incentive fee[4] than necessary.

Background

[1]We issued Report Number IG-00-015, "Space Flight Operations Contract Phase II - Cost-Benefit Analysis," March 14, 2000.
[2]In FY 1998, the contract price was reduced for two fewer flights than the seven flights originally estimated.
[3]Contract price is the sum of target cost and fees.
[4]The report section entitled Effect of Flight Rate Credit explains why NASA may be paying more incentive fee than appropriate.

In September 1996, Johnson awarded a noncompetitive contract to United Space Alliance (USA)[5] as the prime Space Shuttle contractor responsible for operations and maintenance of the Shuttle fleet. Early in 1996, a NASA acquisition team was tasked to develop an

[5]USA is a joint venture between Boeing and Lockheed Martin.

approach to initiate an SFOC by September 1996. Accordingly, the team developed a concept termed "activity-based costing"[6] that was intended to expedite negotiation of the SFOC and protect the Government's interest.

Under activity-based costing, Johnson and USA personnel jointly agree on the resources needed for a task and sign an agreement on which USA bases its proposal. When the contracting officer receives the proposal, the contracting officer verifies that the proposal is based on the partnering agreement and that the contractor used the correct forward pricing rates[7] for the agreed-to resources in the proposal.

Johnson awarded the original contract based on an annual rate of seven Shuttle flights. Because of the uncertainty of the annual Shuttle flight rate, the contract provided for an adjustment to the contract price when the actual flight rate varied from the baseline by more than one flight. In FY 1998, NASA and USA experienced a reduced flight rate that required an adjustment to the contract price. Johnson requested and received a proposal for the reduction of two flights in FY 1998. Subsequently, Johnson and USA negotiated an adjustment credit to the contract using activity-based costing. In FY 1999, NASA and USA again experienced a reduced flight rate that required an adjustment to the contract price.[8] Johnson and USA are again using activity-based costing to expedite the negotiation.

Recommendations

We recommended that the Director, Johnson Space Center:

- Determine whether Johnson should continue to use activity-based costing.
- If activity-based costing is to be used, establish policies and procedures that explain how that process can be used to comply with FAR requirements.
- Perform an adequate technical, cost, or price analysis on each SFOC pricing action, and document the analysis in the contract file.
- Verify that the appropriate forward pricing rates are used in the FY 1999 flight rate credit proposal, and document the verification in the SFOC contract file.

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[6]Johnson is the only Center using the activity-based costing approach and is using it only on the SFOC. Under activity-based costing, the technical personnel for the Government and contractor jointly agree on the necessary resources. The contractor then prepares the proposal based on the agreements by both parties. The contracting officer verifies that the proposal is based on the partnering agreement and on the latest forward pricing rates.

[7]Forward pricing rates are direct and indirect rates that have been audited and approved by the administrative contracting officer for pricing proposals. Forward pricing rates are updated periodically.

[8]Johnson requested an FY 1999 flight rate credit proposal from USA in April 1999; however, USA has not yet submitted its proposal. Johnson scored USA lower in schedule/manifest effectiveness for award fee purposes because the proposal is late.

Management Response

Management concurred with all recommendations. The Director, Johnson Space Center, has determined that the activity-based costing process is a viable option, has begun the process of updating and expanding guidance for activity-based costing, agreed to strengthen the contract file documentation, and will verify that the contractor has used the correct forward pricing rates in its flight rate credit proposal for FY 1999.

Details on the status of the recommendations are in the recommendations section of the report.

[Original signed by]

Roberta L. Gross

Enclosure
Final Report on Audit of Space Flight Operations Contract Phase II

FINAL REPORT
AUDIT OF SPACE FLIGHT OPERATIONS CONTRACT PHASE II

W August 4, 2000

TO: AA/Director, Lyndon B. Johnson Space Center

FROM: Assistant Inspector General for Auditing

SUBJECT: Final Report on the Audit of Space Flight Operations Contract Phase II
Assignment Number A9906401
Report Number IG-00-039

The subject final report is provided for your information and use. Our evaluation of your response is incorporated into the body of the report. Management comments were responsive to the recommended corrective actions. Management's actions are sufficient to close Recommendation 1 for reporting purposes. Recommendations 2, 3, and 4 will remain open for reporting purposes until corrective actions are completed. Please notify us when actions have been completed on those recommendations, including the extent of testing performed to ensure corrective actions are effective.

If you have questions concerning the report, please contact Mr. Dennis E. Coldren, Program Director, Human Exploration and Development of Space Audits, at (281) 483-4773, or Mr. Dennis Clay, Auditor-in-Charge, at (281) 483-0482. 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:
AI/Associate Deputy Administrator
B/Chief Financial Officer
B/Comptroller
BF/Director, Financial Management Division
G/General Counsel
H/Associate Administrator for Office of Procurement
M/Associate Administrator for Office of Space Flight
JM/Acting Director, Management Assessment Division

MA/ Assistant Manager, Space Shuttle Program Office

bcc:
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W/Program Director, Human Exploration and Development of Space Audits
W/Auditor-in-Charge
JSC/BD5/Audit Liaison Representative

NASA Office of Inspector General

IG-00-039 **August 4, 2000**
A9906401

Space Flight Operations Contract
Phase II

Introduction

The NASA Office of Inspector General has performed an audit to evaluate management of Phase II of the SFOC. Specifically, our objectives were to determine whether contract requirements were properly determined, fair and reasonable pricing was obtained, and cost savings and other SFOC goals have been achieved. During an earlier phase of the audit, we reported the need for a cost-benefit analysis before further consolidation of the Space Shuttle contracts under SFOC at Johnson. We recommended that NASA perform this analysis before further consolidation of Space Shuttle contracts and evaluate at least annually whether estimated benefits are realized. NASA agreed to take corrective action on those recommendations. This report discusses the audit objective related to obtaining fair and reasonable pricing and the need for NASA to document its activity-based procurement process used on the SFOC if the Agency continues to use the process. Details on our overall objective, scope, and methodology are in Appendix A.

Results in Brief

NASA management of Phase II of the SFOC needs improvement. We found that NASA cannot be assured it received fair and reasonable pricing because the FY 1998 flight rate credit analysis was not fully documented in the contract file in accordance with FAR requirements. Specifically, the SFOC file did not contain the evidence of a technical, price, or cost analysis or verification of direct and indirect rates that the contracting officer should have used to determine whether the FY 1998 flight rate credit of $33.3 million was fair and reasonable. Absent documentation for activity-based costing, there is no basis on which to conclude that an adequate technical, price, or cost analysis was performed. As a result, NASA cannot be assured that the $33.3 million represents a full contract price reduction from the two cancelled flights and, therefore, NASA may be paying USA more incentive fee than necessary (see the Finding).

Background

In 1996, Johnson awarded a noncompetitive contract to USA as the prime Space Shuttle contractor responsible for operation and maintenance of the Shuttle fleet.[9] (See Appendix B for

[9] The NASA Acquisition team briefed the activity-based costing approach for the SFOC to the NASA Associate Administrator and Deputy Associate Administrator for Office of Procurement, Defense Contract Audit Agency

overall contract details.) As the prime contractor on the SFOC, USA assumed responsibility for ensuring Shuttle missions manifested by NASA are successfully accomplished. The contract has two phases within which Johnson consolidates prior prime contracts over time as USA assumes more responsibility.

Flight Rate Credit for Fiscal Year 1998

Finding. The SFOC procurement file did not contain evidence of a technical, price, or cost analysis or verification of direct and indirect rates that the contracting officer should have used to determine whether the FY 1998 flight rate credit of $33.3 million was fair and reasonable, as required by the FAR. NASA relied solely on the activity-based costing process to negotiate the FY 1998 flight rate credit. The process relied heavily on the experience of NASA's technical managers rather than on a traditional FAR-required technical analysis to support a contract pricing action. However, no formal guidance exists on activity-based costing. Moreover, that process did not fulfill FAR requirements for documentation of a technical, price, or cost analysis or verification of direct and indirect rates. As a result, NASA cannot be assured that the $33.3 million represents a full contract price reduction from the two cancelled flights and, therefore, NASA may be paying more incentive fee[10] than necessary.

Requirements of the Federal Acquisition Regulation

FAR Part 15, "Contracting by Negotiation," prescribes policies and procedures governing competitive and noncompetitive negotiated acquisitions.[11] The FAR makes the contracting officer responsible for the following:

- obtaining information that is adequate for evaluating the reasonableness of the price or for determining cost realism;
- performing a cost or price analysis to develop a negotiation position that facilitates agreement by the contracting officer and the offeror on a fair and reasonable price;
- performing a cost analysis and evaluating the reasonableness of individual cost elements when cost or pricing data[12] are required;
- documenting all audit and field pricing information, whether written or reported telephonically or electronically, in the official contract file; and
- examining and analyzing the contractor's proposal even if the contractor has signed a Certificate of Current Cost or Pricing Data.[13]

(DCAA), and Defense Contract Management Agency. The DCAA provides audit services to NASA. The Defense Contract Management Agency provides contract administration services to NASA.

[10]See discussion on Effect of Flight Rate Credit, which explains why NASA may be paying more incentive fee than appropriate.

[11]A negotiated contract is any contract awarded using other than sealed bidding procedures. Sealed bidding is a method of contracting that employs competitive bids, public opening of bids, and awards.

[12]"Cost or pricing data" are all facts that prudent buyers and sellers would reasonably expect to affect price negotiations significantly, as of a certain date, and as close as practicable to the date of agreement on price.

The FAR also requires that a technical analysis be performed that, at a minimum, examines the types and quantities of material proposed and the need for the types and quantities of labor hours and the labor mix. (See Appendix C for pertinent text of FAR Part 15.)

The FAR essentially requires civil servants to maintain an arm's-length relationship between the Government and the contractor, avoiding any conflict of interests, and documentation of the negotiation process. An arm's-length relationship means both the Government and contractor will act in their respective interests and negotiate with each other in good faith. FAR Subpart 3.1, "Safeguards," states:

> Government business shall be conducted in a manner above reproach and, except as authorized by statute or regulation, with complete impartiality and with preferential treatment for none. Transactions relating to the expenditure of public funds require the highest degree of public trust and an impeccable standard of conduct.

Field Pricing Support

Field pricing support is the traditional approach that is used to procure goods and services for the Government. Under this approach, the contracting officer requests cognizant Government parties[14] to perform a technical, price, or cost analysis and to provide the analysis to the contracting officer for development of the Government's position. This support contributes to the basis of the contracting officer's prenegotiation position. However, in December 1998, the Johnson Pricing Office waived field pricing support for the FY 1998 flight rate credit because the contracting officer used activity-based costing. The Johnson Pricing Office also considered information available to the contracting officer adequate for determining reasonableness of the cost. The contracting officer had a copy of a signed agreement between USA and the Government for determining resources,[15] forward pricing rates for indirect cost, and a forward pricing process for direct labor. But the waiver did not relieve the contracting officer from his responsibility to ensure that the Government's interest is protected and that the pricing is fair and reasonable as prescribed by the FAR. To show that the pricing was fair and reasonable, the contracting officer should maintain a contract file with documents that show his or her compliance with the FAR requirements and that he or she has acted in the Government's best interest. Specifically, the documentation should include information on the team partnering meetings and the verification that USA used the current forward pricing rates in its proposal, even though USA had signed a Certificate of Current Cost or Pricing Data at the end of negotiations.

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[13]When the contractor submits cost or pricing data for negotiation of a contract and as close as possible to the date that negotiations are complete, the FAR requires the contractor to revise the data to make it current and to sign a statement that the cost or pricing data is current.

[14]DCAA provides NASA with audits of contractor proposals when requested. NASA engineers and technical personnel perform the technical evaluation and provide the results to the contracting officer.

[15]The Space Shuttle Business Manager and Space Shuttle Program Assistant Manager signed an agreement with the USA Business Manager, referred to as a decision package, that laid out the estimated cost for flight-specific resources required for launch support, mission and recovery operations, overtime, travel support, procurement of

Shuttle Flight Marginal Cost

A representative from the Johnson Space Shuttle Business Office told us that the marginal cost[16] of a Shuttle flight is the variable cost associated with the addition or reduction of one flight from the Shuttle manifest, independent of any other change. The marginal cost includes consumables, expendable hardware, and labor that can be added or removed due to temporary adjustments in the flight rate. The marginal cost to add a flight can start accruing as much as 3 years before a flight occurs and continues for about a year after the flight. However, the cost savings of eliminating a flight with a 1-year notice begins about a year before a flight and continues for about 3 years after the flight.[17] The dollar impact depends on:

- timing of the decision by NASA to eliminate a flight,
- nature of the mission,
- effect on other operational activities,
- ongoing flight rate, and
- manifest.

NASA's estimate is very subjective due to the many variables associated with the flight rate. The estimated cost involves a significant element of judgment by NASA in order to calculate the savings associated with a cancelled flight or the cost of an additional flight. Also, flights are seldom cancelled; rather, the flights are usually postponed.

NASA estimated the cost and potential savings of canceling a Shuttle flight in 1998 at about $57.1 million for the total Shuttle Program with a 1-year notice.[18] We calculated the SFOC-related cost at about $18.9 million.[19]

Effect of Flight Rate Credit

USA proposed $33.3 million for the FY 1998 flight rate credit. The following table shows the breakout of target cost and fees for the $33.3 million:

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repair and spare flight hardware, minor consumables/functional material, and subcontract effort related to the flight rate decrease.

[16]Marginal cost is the cost associated with the manifest for adding or deleting a Shuttle flight. Marginal cost is much lower than average cost, because marginal cost does not consider the fixed cost of the large infrastructure needed to support the Shuttle Program.

[17]The savings extend over a 3-year period following a cancelled flight because some items, such as external tanks, will have already been finished or nearly finished when the flight is cancelled (with a 1-year notice). Subsequently, NASA has to build these items in the next cycle. Therefore, the savings extend over a period of about 3 years.

[18]NASA estimated the marginal cost of a Shuttle flight in 1998 as part of the FY 2000 budget process.

[19]The solid rocket boosters were consolidated into SFOC in June 1998. Therefore, for one flight, we calculated the $18.9 million by adding $12.9 million for the SFOC to $6 million for solid rocket boosters. The $38.2 million difference between the total Program cost of $57.1 million and the SFOC-related cost of $18.9 million represented Flight Equipment Processing Consumables of $.2 million, Kennedy Launch Operations of $2.4 million, Space Shuttle Main Engines of $1.5 million, External Tanks of $19 million, and Reusable Solid Rocket Motors of $15.1 million.

FY 1998 Flight Rate Credit
(Millions)

Description	Amount
Flight Operations	$1.1
Ground Operations	7.5
Integrated Logistics	6.6
Orbiter cost	2.5
Program Integration cost	.8
Target cost	$18.5
Fees*	14.8
Total	$33.3

* The amount of fees appears to be out of proportion to the cost; however, fees consist of award fee, incentive fee, and performance fee. The performance fee is based on a successful flight and is $13.8 million for the two flights, regardless of how much of the cost was incurred.

When NASA agreed to the $33.3 million flight rate credit, the total credit to the contract price was the sum of the target cost and fees. Since USA is entitled to 35 percent of each dollar underrun on the contract target cost, USA benefits by keeping the target cost as high as possible. For example, if the contract target cost should have been reduced by another $5 million for the flight rate credit, but was not reduced, then USA would declare an additional $5 million of contract underruns. Because USA earns an incentive fee based on 35 percent of underruns, the calculated benefit to USA would be an additional $1.75 million (35 percent of $5 million).[20]

NASA Lacks Formal Guidance on Activity-Based Costing

Neither NASA nor Johnson has established policies and procedures for using activity-based costing to procure goods and services from contractors. While Johnson has provided some informal training on activity-based costing to its procurement personnel involved in the SFOC, the FAR is the only formal guidance. Even though the FAR contains guidance on contracting and pricing, the FAR does not specifically address activity-based costing. However, the FAR does require the contracting officer to obtain information that is adequate for evaluating the reasonableness of the prices and to document all audit and field pricing information, whether written or oral, in the official contract file.

Contracting Officer Reliance on Activity-Based Costing

The contracting officer relied solely on the activity-based costing process to price the FY 1998 flight rate credit instead of obtaining field pricing support. The process relies on the experience of its technical managers in the partnering sessions to take the place of the FAR-required technical analysis to support a pricing action. Such a partnering process may be more efficient than obtaining field pricing support

[20]SFOC is a cost-type contract, which means that NASA reimburses USA only for its allowable incurred costs and contract fees. (See Appendix B for overall contract details.)

after a proposal is received because, with activity-based costing, NASA's managers are involved early, instead of later in the process. Also, the partnering may have fulfilled the intent of the FAR had the results been documented. However, none of the sessions were documented or attended by the contracting officer, and there is no documentation that the proposed rates were verified with the approved forward pricing rates.

Guidance for Activity-Based Costing

Absent guidance or evidence in the contract file, it is not clear how NASA is complying with FAR Part 15. The use of activity-based costing does not ensure compliance with the FAR. The contracting officer must show that the Government's best interest was protected and that fair and reasonable pricing was obtained by documenting the technical, cost, or price analysis on each SFOC pricing action in the contract file. The participation of the technical managers in the process does not automatically satisfy the FAR. Nor does a signed Certificate of Current Cost or Pricing Data ensure that the contractor is using the correct forward pricing rates. The FAR requires a documented analysis and that the contracting officer ensure that the results are adequate and documented.

An analysis of a contractor's proposal is essential to determining the fairness and reasonableness of the price. If the Johnson Space Center continues to use activity-based costing, the Agency should establish guidance to ensure its procurement personnel understand their responsibility to comply with the FAR regardless of the procurement process used. The guidance should specify the contract file documentation needed to show compliance with the FAR. Without documentation, there is not sufficient evidence that the Government's interest has been adequately protected or that fair and reasonable pricing has been obtained.

If NASA does not continue to use activity-based costing, it should still ensure that adequate technical, cost, or price analysis is performed and documented in the contract file to support the Government's prenegotiation position and final price agreed to by all parties.

Recommendations, Management's Response, and Evaluation of Response

The Director, Johnson Space Center, should:

1. **Determine whether Johnson should continue to use activity-based costing.**

2. **If activity-based costing is used, establish policies and procedures for using activity-based costing that explain how that process can be used to comply with FAR requirements.**

3. **Perform an adequate technical, cost, or price analysis on each SFOC pricing action, and document the analysis in the contract file, in accordance with the FAR.**

4. **Verify that the appropriate forward pricing rates are used in the FY 1999 flight rate credit proposal, and document the verification in the SFOC contract file.**

Management's Response. Concur with all recommendations. In response to the recommendations, the Director, Johnson Space Center, has done the following:

- Determined that the activity-based costing process is a viable option.
- Begun the process of updating and expanding guidance for activity-based costing.
- Agreed to strengthen the contract file documentation.
- Agreed to verify that the contractor has used the correct forward pricing rates in its flight rate credit proposal for FY 1999.

The complete text of management's comments is in Appendix D.

Evaluation of Response. The actions taken or planned by management are responsive to the recommendations. In a separate correspondence, management provided estimated completion dates of October 31, 2000, and January 31, 2001, for Recommendations 3 and 4, respectively. We consider Recommendation 1 closed for reporting purposes. The remaining recommendations are resolved, but will remain undispositioned until agreed-to corrective actions are completed.

Appendix A. Objective, Scope, and Methodology

Objective

The overall objective was to evaluate management of the SFOC Phase II. The specific objective covered in this report was to determine whether fair and reasonable pricing was obtained.

Scope and Methodology

Our audit included a review of the rationale and plan for SFOC consolidation. We reviewed budget and spending data for fiscal years 1994 through 1999 provided by the Shuttle Program Office. We also reviewed contract files for the completed Phase II negotiations and fiscal year 1998 flight rate credit. We interviewed Shuttle Program personnel to understand the history of the procurement and the possible future of the SFOC. We did not assess the reliability of computer-processed data because we did not rely on it to achieve our objective.

Management Controls Reviewed

For this report, we reviewed management controls relative to analysis and documentation requirements for procurements as described in FAR Part 15, "Contracting by Negotiation."

We determined that controls needed to be strengthened to ensure that analysis and documentation in contract files are in accordance with FAR Part 15 (see the Finding).

Audit Field Work

We performed the audit field work for the issues discussed in this report from February through April 2000. We conducted the audit in accordance with generally accepted government auditing standards.

Appendix B. Space Flight Operations Contract

Brief Description of the Statement of Work. USA has overall responsibility as the prime contractor to include all Space Shuttle Program[21] and International Space Station Program[22] activities defined in the contract. The work shall be performed so that all missions manifested by NASA are successfully accomplished in accordance with the NASA Space Transportation System 07700, Volume III, Space Shuttle Flight Definition and Requirements Directive; and NASA Space Transportation System 08178, Space Shuttle Program Schedules, for:

- overall flight definition and planning guidelines;
- near-term flight assignments, characteristics, and configuration;
- flight preparation configuration freeze point definitions;[23]
- follow-on flight rate requirements by fiscal year;
- required capability enhancements in support of flight missions; and
- orbiter maintenance and down time schedule.

During the contract period, USA shall perform all work necessary and appropriate to support scheduled missions pursuant to the mission profile. The Space Shuttle vehicle elements for which USA has overall responsibility consist of the fleet of orbiter vehicles; solid rocket boosters and reusable solid rocket motors; external tanks; Space Shuttle main engines; flight crew equipment; and ground support systems, flight software, and integration of payloads manifested by NASA.

Date Awarded and Price. The SFOC (contract number NAS 9-20000) was awarded September 26, 1996, for $6.9 billion. The contract value was $8.6 billion as of March 29, 2000 (through contract modification number 450).

Contract Type. The contract is a cost-plus-award fee, incentive fee, and performance fee contract.

Completion Date. The basic contract is a 6-year contract with a period of performance from October 1996 through September 2002. The contract has two options to extend the period of performance for 2 years each that, if exercised, would extend the contract another 4 years through September 2006.

Contractor. The contractor is USA, a joint venture between The Boeing Company and Lockheed Martin Corporation.

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[21]NASA's plan for the SFOC was designed to include a subset of the Shuttle Program contracts and activities specifically focused on the operational functions of the Shuttle Program. Development activities were not targeted for consolidation and neither were science activities or institutional activities required to support the Shuttle Program.
[22]The International Space Station Program activities targeted for SFOC were very limited and focused primarily on the mission operations functions integrally associated with flight controller support, mission planning, and training.
[23]Program freeze points are points in time when the cargo, vehicle hardware and software, launch site flow, and other key aspects of a flight have been defined and baselined.

Appendix B

Primary Locations of Performance. The Johnson Space Center and the Kennedy Space Center are the primary locations of performance on the contract.

Costs Incurred to Date. As of March 30, 2000, NASA had disbursed $4.8 billion on the contract.

Cost And Schedule Performance. As of March 30, 2000, USA had declared $105 million of cost underruns.

Other Performance Information. USA's award fee scores have ranged from 81 to 86, out of a possible score of 100.

Appendix C. Requirements of the Federal Acquisition Regulation

FAR Part 15, "Contracting by Negotiation," prescribes the following policies and procedures governing competitive and noncompetitive negotiated acquisitions.

FAR Subpart 15.403-3, "Requiring information other than cost or pricing data," states:

> The contracting officer is responsible for obtaining information that is adequate for evaluating the reasonableness of the price or determining cost realism….

FAR Subpart 15.404-1, "Proposal analysis techniques," states:

> The contracting officer is responsible for evaluating the reasonableness of the offered prices. … Price analysis shall be used when cost or pricing data are not required. … Cost analysis shall be used to evaluate the reasonableness of individual cost elements when cost or pricing data are required. … The contracting officer may request the advice and assistance of other experts to ensure that an appropriate analysis is performed. …
>
> Cost analysis is the review and evaluation of the separate cost elements and profit in an offeror's or contractor's proposal (including cost or pricing data or information other than cost or pricing data), and the application of judgment to determine how well the proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency. … The Government may use various cost analysis techniques and procedures to ensure a fair and reasonable price, given the circumstances of the acquisition. …
>
> The contracting officer may request that personnel having specialized knowledge, skills, experience, or capability in engineering, science, or management perform a technical analysis of the proposed types and quantities of materials, labor, processes, special tooling, facilities, the reasonableness of scrap and spoilage, and other associated factors set forth in the proposal(s) in order to determine the need for and reasonableness of the proposed resources, assuming reasonable economy and efficiency. … At a minimum, the technical analysis should examine the types and quantities of material proposed and the need for the types and quantities of labor hours and the labor mix. Any other data that may be pertinent to an assessment of the offeror's ability to accomplish the technical requirements or to the cost or price analysis of the service or product being proposed should also be included in the analysis.

FAR Subpart 15.404-2, "Information to support proposal analysis, " states:

> The contracting officer should request field pricing assistance when the information available at the buying activity is inadequate to determine a fair and reasonable price. The contracting officer must tailor requests to reflect the minimum essential supplementary information needed to conduct a technical or cost or pricing analysis. …
>
> The contracting officer must tailor the type of information and level of detail requested in accordance with the specialized resources available at the buying activity and the magnitude and complexity of the required analysis. Field pricing assistance is generally available to provide--(i) Technical, audit, and special reports associated with the cost elements of a proposal, including subcontracts; (ii) Information on related pricing practices and history;

(iii) Information to help contracting officers determine commerciality and price reasonableness, … (iv) Information relative to the business, technical, production, or other capabilities and practices of an offeror. …

When field pricing assistance is requested, contracting officers are encouraged to team with appropriate field experts throughout the acquisition process, including negotiations. Early communication with these experts will assist in determining the extent of assistance required, the specific areas for which assistance is needed, a realistic review schedule, and the information necessary to perform the review. …

Audit and field pricing information, whether written or reported telephonically or electronically, shall be made a part of the official contract file ….

FAR Subpart 15.405, "Price negotiation," states:

The purpose of performing cost or price analysis is to develop a negotiation position that permits the contracting officer and the offeror an opportunity to reach agreement on a fair and reasonable price.

FAR Subpart 15.406-2, "Certificate of Current Cost or Pricing Data, " states:

When cost or pricing data are required, the contracting officer shall require the contractor to execute a Certificate of Current Cost or Pricing Data …. Possession of a Certificate of Current Cost or Pricing Data is not a substitute for examining and analyzing the contractor's proposal.

Appendix D. Management's Response

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
2101 NASA Road 1
Houston, Texas 77058-3696

Reply to Attn of: BD5

JUL 26 2000

TO: NASA Headquarters
Attn: W/Assistant Inspector General for Auditing

FROM: AA/Director

SUBJECT: Management Response to OIG's Draft Audit on Audit of Space Flight Operations Contract Phase II, Assignment Number A9906401

We have reviewed the subject draft report, and thank you for the opportunity to provide comments. We concur with the findings, and specific actions taken or planned are discussed in the enclosure.

If you have any questions regarding this response, please contact Ms. Pat Ritterhouse, Audit Liaison Representative, at 281-483-4220.

George W. S. Abbey

George W. S. Abbey

Enclosure

cc:
BA/R. K. Gish
BV/H. H. Baker
MA/J. C. Boykin
HQ/HK/J. E. Horvath
HQ/JM/J. D. Werner
HQ/MA/J. H. Rothenberg
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Management Response to OIG's Draft Audit on Audit of Space Flight Operations Contract Phase II, Assignment Number A9906401

Auditor's Findings

"Neither NASA nor Johnson has established policies and procedures for using activity-based costing to procure goods and services from contractors. While Johnson has provided some informal training on activity-based costing to its procurement personnel involved in SFOC, the FAR is the only formal guidance. Even though the FAR contains guidance on contracting and pricing, the FAR does not specifically address activity-based costing. However, the FAR does require the contracting officer to obtain information that is adequate for evaluating the reasonableness of the prices and to document all audit and field pricing information, whether written or oral, in the official contract file."

"The use of activity-based costing does not ensure compliance with the FAR. The contracting officer must show that the Government's best interest was protected and that fair and reasonable pricing was obtained by documenting the technical, cost, or price analysis on each SFOC pricing action in the contract file. The participation of the technical managers in the process does not automatically satisfy the FAR. Nor does a signed Certificate of Current Cost or Pricing Data ensure that the contractor is using the correct forward pricing rates. The FAR requires a documented analysis and that the contracting officer ensure that the results are adequate and documented."

Recommendations for Corrective Actions

"The Director, Johnson Space Center, should:

1. Determine whether Johnson should continue to use activity-based costing.

2. If activity-based costing is used, establish policies and procedures for using activity-based costing that explain how that process can be used to comply with FAR requirements.

3. Perform an adequate technical, cost, or price analysis on each SFOC pricing action, and document the analysis in the contract file, in accordance with the FAR.

4. Verify that the appropriate forward pricing rates are used in the FY 1999 flight rate credit proposal, and document the verification in the SFOC contract file."

JSC Comments

As a general comment, it should be noted that the process and resulting file documentation for the negotiation of the Fiscal Year (FY) 1998 flight rate credit, the review of which is the basis for all of the recommendations in this report, is not representative of the typical negotiated change on the Space Flight Operations Contract (SFOC). In a typical SFOC change negotiation utilizing the activity-based costing process, the Contracting Officer is personally involved in the partnering process, ensures that the necessary technical and cost analyses are performed, documents the analyses

Enclosure

in the file, and verifies that the appropriate forward pricing rates are used. The flight rate credit activity was unique in that it impacted all elements of the contract (e.g., Orbiter vehicle engineering, flight operations, ground processing, logistics, cargo integration) and required the development of an estimate for work that was not performed. Partnering of the resources to be credited to the contract was done by multiple Technical Manager's Representatives (TMR's) at multiple locations at a very high level. It was not practical to involve the Contracting Officer in all of these partnering sessions, nor did these discussions result in the level of file documentation that is typically generated for a contract change negotiation.

We believe that the activity-based costing process used on the SFOC contract meets the intent of the FAR. The FAR requirements that apply to the negotiation of changes contemplate a more traditional serial process while the activity-based costing process is built upon the concept of partnering, where NASA and the contractor jointly develop requirements and agree upon the necessary resources. Due to the different nature of this process, the required analyses and documentation are accomplished in a different manner. Our experience is that the activity-based costing process results in a better up-front definition of the requirements, a more meaningful technical analysis, a better common understanding of the resources required, and can be completed in less time than that required for the more traditional proposal/evaluation/negotiation process contemplated by the FAR. The FY 1998 flight rate credit action was the only contract file reviewed and considered in your evaluation of the activity-based costing process. In our opinion, a valid assessment of this process would require a larger sampling of the numerous actions for which this process has successfully been used under the SFOC contract.

Response to Recommendation 1:

Concur. The activity-based costing process is a viable option that will continue to be used for SFOC, and may be used on future contracts. We consider this recommendation closed.

Response to Recommendation 2:

Concur. While the activity-based costing process was used in the "bunker" by the Contract Acquisition Team for the negotiation of the basic SFOC contract in 1996 and has been used extensively and very successfully since that time, we agree that the activity-based costing process could be better documented. We are reviewing the existing activity-based costing documentation, and have begun the process of updating and expanding that guidance with an estimated completion date of September 30, 2000.

Response to Recommendation 3:

Concur. We believe that adequate technical, cost, or price analyses are currently being performed on each SFOC pricing action and that these analyses are being well-documented in the contract files. As stated previously, the FY 1998 flight rate credit activity is not representative of a typical negotiation on the SFOC contract. For all SFOC change negotiations, a thorough technical analysis and a thorough cost analysis are performed and documented in the file. Once the activity-based costing process documentation has been updated, as discussed under recommendation 2, these analyses and their associated file documentation will be further strengthened. We consider this recommendation closed.

Response to Recommendation 4:

Concur. Once the partnered FY 1999 flight rate credit proposal has been received from the contractor, expected by mid-October 2000, the Contracting Officer will verify that the appropriate forward pricing rates have been used, and include documentation to that effect in the SFOC contract file.

Regarding the FY 1998 flight rate credit negotiation, while it is true that a Certificate of Current Cost or Pricing Data does not ensure that the contractor is using the correct forward pricing rates, by signing the Certificate, the contractor is attesting to the fact that the negotiated forward pricing rates were used in the proposal and is subject to penalties and reductions in price due to defective cost or pricing data (reference contract clause 52.215-22 Price Reduction for Defective Cost or Pricing Data) if the contractor were to use incorrect rates.

Appendix E. Report Distribution

National Aeronautics and Space Administration (NASA) Headquarters

A/Administrator
AI/Associate Deputy Administrator
B/Chief Financial Officer
B/Comptroller
BF/Director, Financial Management Division
G/General Counsel
H/Associate Administrator for Procurement
HK/Director, Contract Management Division
HS/Director, Program Operations Division
J/Associate Administrator for Management Systems
JM/Acting Director, Management Assessment Division
L/Associate Administrator for Legislative Affairs
M/Associate Administrator for Space Flight

NASA Centers

Director, Lyndon B. Johnson Space Center
Director, Marshall Space Flight Center
Director, John F. Kennedy Space Center
Chief Counsel, John F. Kennedy Space 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 Acquisitions 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
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, Committee on Science

Congressional Member

Honorable Pete Sessions, U.S. House of Representatives

NASA Assistant Inspector General for Auditing
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Report Title: Audit of Space Flight Operations Contract Phase II

Report Number: **Report Date:**

Circle the appropriate rating for the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	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
Very Good — Poor
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)

Congressional Staff	Media
NASA Employee	Public Interest
Private Citizen	Other: ______________________

Government: _________ Federal: __________ State: _________ Local: _________

May we contact you about your comments?

Yes: _____________ **No: _____________**
Name: ______________________________________
Telephone: _________________________________

Thank you for your cooperation in completing this survey.

Major Contributors to the Report

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