IG-97-011

AUDIT REPORT

SHUTTLE PROCESSING CONTRACT SUBCONTRACTING - CIRCUMSTANCES INDICATING PROCUREMENT FRAUD

KENNEDY SPACE CENTER, FLORIDA

DECEMBER 20, 1996

National Aeronautics and Space Administration

OFFICE OF INSPECTOR GENERAL

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

Reply to Attn of: W

December 20, 1996

TO: Kennedy Space Center
Attn: CD/Director

FROM: W/Assistant Inspector General for Auditing

SUBJECT: Final Audit Report
Shuttle Processing Contract Subcontracting -
Circumstances Indicating Procurement Fraud
Assignment Nos. A-KE-93-011 and A-KE-95-003
Report No. IG-97-011

The Office of Inspector General (OIG) has completed the audit of Shuttle Processing Contract (SPC) Subcontracting. Our audit objective was to determine the effectiveness of the SPC subcontracting activities. This is the final report on circumstances indicating procurement fraud in two construction subcontracts. We issued a final Shuttle Processing Contract Subcontracting audit report (KE-95-007) on February 9, 1995 that addressed all other aspects of SPC subcontracting.

We found the SPC's award and administration of two construction subcontracts was ineffective resulting in the payment of $2,076,073 in unsupported costs of which at least $885,519 should be disallowed. We also identified numerous procurement fraud indicators associated with these subcontracts which should have alerted the SPC Procurement management and the Kennedy Space Center's (KSC) SPC Contracting Officer to possible problems. We referred this information to the OIG's Investigative staff for further action.

On August 1, 1995, we issued a discussion draft report. On October 30, 1995, the KSC's Procurement Office Director requested the opportunity to review the subcontract files and our workpapers with legal counsel and a construction contracting officer. On December 12, 1995, the Center completed its review and provided comments to us. We incorporated the comments and reissued a revised discussion draft on August 28, 1996. We held an exit conference on September 20, 1996. We made appropriate changes and issued a draft report on October 15, 1996. We received a written response on November 22, 1996. This response is summarized in the recommendation section of this report and is included in its entirety in the Appendix A.

Management concurred with all the report recommendations and has already taken several actions to enhance the SPC's procurement practices. We have reviewed the data and management's response to the recommendations and consider recommendations 1, 2, and 4 to be closed upon issuance of this report. We request to be included in the resolution process of recommendation 3.

If you have any questions or need additional information, please call Len Diamond at (407)-867-4664; or Robert Wesolowski, Audit Division A, or me at (202) 358-1232.

Debra A. Guentzel

cc:
KSC/DA/A. Parrish
/HM/J. Jennings
/HM-CIC-/J. Nary

ACRONYMS

Acronym	Meaning	Clarification (as needed)
BOA	Basic Ordering Agreement	Generic terms and conditions included in the **SPC** subcontract.
D&B	Dun & Bradstreet	
FAR	Federal Acquisition Regulation	
FCN	Field Change Notice	The SPC term for directions to a subcontractor **which** alter or expand tasks required by the original subcontract.
FE	Field Engineer/Field Engineering	
FPLE	Fixed-Price, Level-of-Effort	
KSC	Kennedy Space Center	
LSOC	Lockheed Space Operations Company	
NASA	National Aeronautics and Space Administration	
NHB	NASA Handbook	
OIG	Office of Inspector General	
PO	Purchase Order	The SPC term for a subcontract of any dollar value for goods or services.
RFI	Request for Information	The SPC term for communication from a subcontractor to Field Engineers or the Subcontract Administrator asking for clarification of an issue.
RFQ	Request for Quotation	
SA	Supplemental Agreement	
SCA	Subcontract Administrator	
SDB	Small Disadvantaged Business	
SOW	Statement(s) of Work	
SPC	Shuttle Processing Contract/Contractor	
SWOB	Small Women-Owned Business	NASA term for a small business 51 percent **owned and** operated by women.
T&M	Time and Materials	
TOD	Technical Order Directive	

TABLE OF CONTENTS

EXECUTIVE SUMMARY

INTRODUCTION

The Kennedy Space Center's (KSC) Shuttle Processing Contractor (SPC) NAS10-10900 is responsible for processing, launch, and recovery of the Space Shuttle and the operation and maintenance of assigned processing and launch facilities. At the time of the audit, Lockheed Space Operations Company (LSOC) was the prime contractor for the SPC. In April 1996, the SPC was novated from LSOC to United Space Alliance as the Space Flight Operations Contract (SFOC). United Space Alliance is a joint venture between Lockheed-Martin and Rockwell that will be responsible for Shuttle processing and flight operations.

The SPC procurement function is responsible for award and administration of subcontracts to accomplish the Shuttle Processing mission. Construction projects are one type of service procured. Construction projects include refurbishment of launch pads and mobile launch platforms and modifications of logistics and launch facilities.

OBJECTIVES

The overall objective of the audit was to determine the effectiveness of the SPC subcontracting activities. Specific objectives included:

* Evaluation of the effectiveness of award and administration of subcontracts.

* Determination of whether KSC was effectively monitoring the SPC subcontracting function.

* Evaluation of compliance with the SPC subcontracting requirements.

RESULTS OF AUDIT

The SPC's award and administration of two construction subcontracts by the SPC was ineffective resulting in (1) the payment of $2,076,073 in unsupported costs, of which at least $885,519 should be disallowed, and (2) additional

program costs of $344,421 because of inadequate performance by the subcontractor. We also identified numerous procurement fraud indicators associated with these subcontracts which should have alerted the SPC Procurement management and the SPC Contracting Officer to possible problems.

Subcontractor Was Not Financially Responsible

The two construction projects (Pad A Refurbishment Project and Electrical Modifications Project) addressed in this report were both awarded to the same subcontractor and administered by the same SPC Subcontract Administrator. The SPC Subcontract Administrator made the determination that the subcontractor was both technically qualified and financially responsible but documentation in the subcontract file indicated that the subcontractor had only 3 employees and a total net worth of $1,000. Because these subcontracts were valued in excess of $500,000, they required and received the KSC SPC Contracting Officer's consent. However, neither the SCA nor the SPC contracting officer requested additional documentation.

Pre-Award Irregularities

The Pad A Refurbishment Project included such serious pre-award irregularities that the subcontract should not have been awarded. The quotation received for the subcontract exactly matched the SPC engineers' revised cost estimate in total and for each of four separate tasks identified in the Request for Quotation. The date stamp representing the SPC Subcontract Administrator's receipt of the quotation had been altered to show receipt of the quotation on the due date. The original date stamp appeared to be a date two days after quotations were due. The subcontract Statement of Work (SOW) was not specific and contained ambiguous terms which left many areas open for interpretation.

Irregular Practices in Negotiating and Processing Subcontract Increases

The SPC Subcontract Administrator for the Pad A Refurbishment Project negotiated several increases to the fixed-price subcontract for work considered by the SPC Field Engineering Office to be included in the scope of the existing subcontract. Increases to the subcontract were processed in an unconventional manner using proposals that had already

been refuted by the SPC Field Engineering Office. Documentation to support price increases negotiated in the subcontract Supplemental Agreement No.2 for $1.8 million was inadequate.

Acceleration Effort Increased $1 Million and Accelerated Date Was Not Met

The SPC did not negotiate a Supplemental Agreement for the acceleration effort on the Pad A Refurbishment project until 6 months after the completion of the project. The negotiated price was nearly $1 million greater than what the subcontractor proposed when the SPC directed the acceleration. Further, the subcontractor did not meet the accelerated completion date and the required clean-up was performed unsatisfactorily. This required shuttle program managers to move the Space Shuttle Endeavour (STS-61) from Pad A to Pad B at a program cost of $344,000.

Serious Weakness In Subcontract Approach

The Electrical Modifications Project included instances and actions that indicated a serious weakness in the subcontract approach. The SPC Subcontract Administrator made decisions regarding the value and type of subcontract without adequate justification. Subcontractor purchase orders for materials were accepted as evidence of material cost rather than the actual material invoices. The decision to accept purchase orders was based on the inappropriate rationale that actual invoices could not be provided because they contained proprietary information. Further, change orders were issued without a not-to-exceed price or cost benefit analysis to justify using the incumbent subcontractor versus conducting a new competition.

We concluded the SPC Subcontract Administrator gave preferential treatment to the subcontractor regarding negotiated amounts and methods of payment. Comments such as the "Olson girls" and that the company was set-up just to get subcontracts at KSC, also suggested that the subcontractor's certification of Small Women Owned Business (SWOB) may be false. However, because the SWOB program is self certifying and there was no protest at time of award the certification was accepted without question.

Both KSC and SPC procurement officials did not take appropriate actions to ensure the integrity of the procurement process. Fraud indicators taken by themselves are not necessarily evidence of procurement fraud. However, their presence, in such numerous instances, should have alerted responsible KSC and SPC procurement personnel to the possibility of unlawful acts. We have referred these matters to the Office of Inspector General's (OIG) investigative staff.

RECOMMENDATIONS

We recommend that KSC:

1. Take the necessary administrative action to ensure more effective construction subcontract award and administration.

2. Ensure that procurement fraud indicators identified in this report have been satisfactorily addressed. *Since work is transitioning from the SPC to the successor contract, increased attention should be applied to construction subcontracts under the new contract.*

3. Review the $2,076,073 of unsupported costs and disallow $885,519 or greater as identified in this report.

4. Determine if the SPC should be held accountable for the additional cost incurred $344,421 (page 19) to move the Shuttle (STS 61) from Pad A to Pad B.

Auditor's Note:

Since the issues in this report have been referred for investigation, we request that KSC coordinate with the OIG prior to taking action on any decisions made regarding the monetary recommendations.

Management's Response

We are concurring in all recommendations. Our specific comments are in Appendix A. Based on actions completed and planned by the cognizant KSC Directors and Support Contractors, recommendations 1,2, and 4 are considered closed.

Evaluation of Management's Response

The actions taken by KSC are responsive to our recommendations. We request to be included in the concurrence cycle to close out recommendation three.

INTRODUCTION

The NASA Office of Inspector General conducted an audit of the SPC NAS10-10900 subcontracting function. Our overall objective was to determine the effectiveness of the SPC subcontracting activities and to evaluate the adequacy of KSC's oversight for these activities.

BACKGROUND

The KSC's SPC is responsible for the processing, launch, and recovery of the Space Shuttle and the operation and maintenance of assigned processing and launch facilities. At the time of the audit, Lockheed Space Operations Company (LSOC) was the prime contractor for the SPC. In April 1996, the SPC was novated to United Space Alliance as the Space Flight Operations Contract (SFOC). United Space Alliance is a joint venture between Lockheed-Martin and Rockwell that will be responsible for Shuttle processing and flight operations.

The SPC procurement function is responsible for award and administration of subcontracts to accomplish the Shuttle Processing mission. Construction projects included refurbishment of launch pads and mobile launch platforms and modifications of logistics and launch facilities.

The SPC construction subcontracts are awarded as firm-fixed-price subcontracts. A firm-fixed-price contract provides for a price that is subject to adjustment only for entitlements under the "changes" clause or other limited circumstances under law and regulation. The contractor accepts maximum risk and responsibility for all costs and resulting profit or loss. (Federal Acquisition Regulation {FAR} 16.202.1)

All the SPC construction projects are informally set aside for Small Disadvantaged Businesses (SDB's) and SWOB's. To qualify as a SDB or SWOB, a firm must be at least 51 percent owned and operated by disadvantaged individuals or women, respectively.

The SPC Modification Management furnishes technical expertise and cost estimates and prepares the SOW that describes the scope and conditions of a construction project. An SPC Procurement

Subcontract Administrator (SCA) prepares the actual documents necessary to write a binding subcontract. The SCA is responsible for the procurement from the beginning of the solicitation process through completion of the project.

The SPC NAS10-10900, Section 1.0.a.4, of the SOW requires that the SPC procurement system be in compliance with applicable NASA procurement regulations.

OBJECTIVES, SCOPE, AND METHODOLOGY

OBJECTIVES

The overall objective of the audit was to determine the effectiveness of the SPC subcontracting activities. Specific objectives included:

* Evaluation of the effectiveness of award and administration of subcontracts.

* Determination of whether KSC was effectively monitoring the SPC subcontracting function.

* Evaluation of the compliance with the SPC subcontracting requirements.

SCOPE AND METHODOLOGY

The scope of our audit was all the SPC subcontracts awarded from July 1, 1992, to June 30, 1993, with the exception of the "team" (Grumman, Thiokol, and Johnson Controls) subcontracts. These three subcontracts provide the same fixed services over the span of the SPC. We reviewed 49 percent ($25,950,142) of the subcontract dollars or 3 percent (71) of the subcontract actions. This included 13 subcontract awards of $500,000 or more.

Through interviews with procurement personnel and file review, we identified several irregularities present in two construction subcontracts. Both SPC construction subcontracts were awarded to Vendor No. 300253606. The two construction subcontracts are described as follows:

PO 704215 - Pad A Refurbishment. The Request For Quotation (RFQ) SF93-018 was sent to eight vendors on January 28, 1993. Five vendors responded to the RFQ. Quoted prices ranged from $3,200,000 to $5,722,005. The RFQ required labor, equipment, and material for the refurbishment effort at LC39A (Pad A). Four tasks were specified: (1) Fixed Service Structure; (2) Rotating Service Structure; (3) North Pipe Bridge, Liquid Oxygen Tower, and Liquid Hydrogen Tower; and (4) Interior Sound Suppression System. The Purchase Order (PO) 704215 was issued on April 6, 1993, to the vendor submitting the lowest quotation for $3,200,000. The total cost at completion of the project was $6,106,137.

PO 704220 - Electrical Modifications. The RFQ SF93-091 was sent to five vendors on April 6, 1993. Five vendors responded to the RFQ. Quoted prices ranged from $682,161 to $844,351. The RFQ required labor, equipment, and materials to perform electrical work and energy conservation work in accordance with Technical Order Directives (TOD's). The PO 704220 was issued on April 28, 1993, to the vendor with the lowest quotation for $750,000 as a Fixed-Price, Level-Of-Effort (FPLE) subcontract. The total contract value at the completion of the project was $875,989.

INDICATIONS OF FRAUD, WASTE, ABUSE, OR ILLEGAL ACTS

During the audit, certain matters came to our attention which indicated possible fraudulent activities. These matters were referred to the OIG's investigative staff for further action. Potential fraud indicators are discussed in the Observation and Recommendations Section. These indicators taken by themselves are not necessarily evidence of procurement fraud. However, the significant number of fraud indicators present in the two construction subcontracts should have alerted responsible KSC and SPC procurement personnel to the possibility of unlawful acts and prompted them to take appropriate actions to ensure the integrity of the procurement process.

Undetected fraud indicators were brought to management's attention in the Rapid Action Report No. KE-95-004, "Shuttle Processing Contract Subcontracting - Undetected Procurement Fraud Indicators," dated November 4, 1994, without describing any of the details due to the possibility of jeopardizing the investigation. The details in this report describe the circumstances relating to those fraud indicators and irregularities.

INTERNAL CONTROLS REVIEWED

We identified and assessed the significant internal controls to the extent necessary to accomplish the audit objectives. We reviewed the appropriate internal controls found in the following contractual, regulatory, and procedural requirements.

* SPC NAS10-10900 Requirements
* SPC Procurement Manual
* SPC Standard Practice Instruction - LG-500(7)K

* SPC Basic Ordering Agreement (BOA)

* NASA Handbook (NHB) 5600.2, Statements of Work Handbook

* FAR 3.501, FAR 6.302, FAR 14.406-4, FAR 15.805, FAR 15.1005, FAR 16.202.1, FAR 16.207, FAR 16.601, FAR 18-36.203, FAR 36.402, FAR 36.207-8, FAR 43.101, FAR 43.102, FAR 43.204, FAR 52.215, FAR 52.224-2, FAR 52.232-7.

In our opinion, the significant number of procurement fraud indicators described in the Observation and Recommendations section demonstrated the consistent circumvention and/or lack of the internal controls over the award and administration of the two SPC construction subcontracts.

AUDIT FIELD WORK

Audit field work was conducted from September 1993 through February 1994 at KSC. The audit was performed in accordance with generally accepted government auditing standards.

OBSERVATION AND RECOMMENDATIONS

OVERALL EVALUATION

Our review identified that the award and administration of two construction subcontracts by the SPC was ineffective resulting in the payment of $2,076,073 in unsupported costs, of which at least $885,519 should be disallowed. The following table summarizes our findings related to those costs.

UNSUPPORTED & DISALLOWED COSTS

PO.	Description	Unsupported	Disallowed	Page
704215	Mistake in Bid	$ 124,903	$ 124,903	13
704215	SA No. 2	$ 1,827,273	$ 680,976	15-17
704220	Material Expenses	$ 38,005	$ 38,005	22
704220	Material Fee	$ 702	$ 702	23
704220	Truck Expenses	$ 34,693	$ 34,693	23
704220	Supervisors OT	$ 1,054	$ 0	22
704220	Extension	$ 27,015	$ 6,240	23
704220	FCN # 3	$ 22,428	$ 0	24
	TOTAL	**$ 2,076,073**	**$ 885,519**	

OBSERVATION

Additional program costs of $344,421 were also incurred because of inadequate performance by the subcontractor. The consistent circumvention and/or lack of internal controls in both construction subcontracts indicated a heightened risk of fraud.

We identified numerous procurement fraud indicators associated with these subcontracts that should have alerted the SPC Procurement management and the SPC Contracting Officer to possible problems. The oversight issue was addressed in the Rapid Action Report No. KE-95-004, "Shuttle Processing Contract Subcontracting-Undetected Procurement Fraud Indicators," dated November 4, 1994. KSC agreed with our recommendation to improve oversight over the award and administration of SPC construction subcontracts and took responsive actions. The circumstances surrounding the fraud indicators are discussed in detail in this report.

The two construction projects (Pad A Refurbishment Project and Electrical Modifications Project) addressed in this report were both awarded to the same subcontractor. The SPC Subcontract Administrator made the determination that the subcontractor was

both technically qualified and financially responsible but documentation in the subcontract file indicated that the subcontractor had only three employees and net worth of $1,000. Because these subcontracts were valued in excess of $500,000, they required and received the SPC Contracting Officer's consent.

The Pad A Refurbishment Project included such serious irregularities that the subcontract should not have been awarded. The quotation received from the subcontractor exactly matched the SPC engineers' revised cost estimate both in total and for each of the four separate tasks identified in the Request for Quotation. The date stamp representing receipt of the quotation by the SCA had been altered to show receipt of the quotation on the due date. The original date stamp appeared to be a date 2 days after the quotations were due. The subcontract SOW was not specific and contained ambiguous terms which left many areas open for interpretation.

The SPC Subcontract Administrator for the Pad A Refurbishment Project negotiated several increases to the fixed-price subcontract for work considered by the SPC Field Engineering Office to be included in the scope of the existing subcontract. Increases to the subcontract were processed in an unconventional manner using proposals that had already been refuted by the SPC Field Engineering Office. Documentation to support price increases negotiated in the subcontract Supplemental Agreement No. 2 for $1.8 million was inadequate.

The SPC did not negotiate a Supplemental Agreement for the acceleration effort on the Pad A Refurbishment project until 6 months after the completion of the project. The negotiated price was nearly $1 million greater than what the subcontractor estimated when the SPC directed the acceleration. Further, the subcontractor did not meet the accelerated completion date and the required clean-up was performed unsatisfactorily. This required shuttle program managers to move the Space Shuttle Endeavour (STS-61) from Pad A to Pad B at a program cost of $344,000.

The Electrical Modifications Project included instances and actions that indicated a serious weakness in the subcontract approach. The SPC Subcontract Administrator made decisions

regarding the value, and type of subcontract without adequate justification. Subcontractor purchase orders for materials were accepted as evidence of material cost rather than the actual material invoices. The decision to accept purchase orders was based on the inappropriate and unsupported rationale that actual invoices could not be provided because they contained proprietary information. Also, change orders were issued without a not-to-exceed price or cost benefit analysis to justify using the incumbent subcontractor versus a new competition.

We concluded the SPC gave preferential treatment to the subcontractor regarding negotiated amounts and methods of payment. Comments such as the "Olson girls" and that the company was set-up just to get subcontracts at KSC, also suggested that the subcontractor's certification of Small Women Owned Business (SWOB) may be false. However, because the SWOB program is self certifying and there was no protest at time of award, the certification was accepted without question.

KSC and SPC procurement officials did not take appropriate actions to ensure the integrity of the procurement process. Fraud indicators taken by themselves are not necessarily evidence of procurement fraud. However, their presence, in such numerous instances, should have alerted responsible KSC and SPC procurement personnel to the possibility of unlawful acts. We have referred these matters to the OIG investigative staff.

Details of the particular circumstances that indicate fraud and illustrate the circumvention and/or lack of internal controls are described below for each of the construction subcontracts.

PO No. 704215, Pad A Refurbishment Project

Date Stamp Altered

The date of receipt on the lowest-priced quotation received for the Pad A Refurbishment Project had been altered. We conducted a file review and interviews but could not determine when the quotation was actually received.

Quotation Exactly Matched Cost Estimate

The quotation also exactly matched Modification Management's revised cost estimate, in total and for each of the four separately priced tasks.

PO No. 704215 TASK	VENDOR'S QUOTATION	ENGINEER'S ESTIMATE
1. Fixed Service Structure	$1,398,400	$1,398,400
2. Rotating Service Structure	$1,209,600	$1,209,600
3. North Bridge & Liquid Oxygen Hydrogen Tower	$ 291,200	$ 291,200
4. Interior Sound Suppression System	$ 300,800	$ 300,800
TOTAL	$3,200,000	$3,200,000

The negotiation summary and the price analysis neglect to mention that the quotation exactly matched the revised cost estimate. The "Subcontracts Purchase Order File" review process did not identify that the lowest quotation exactly matched the revised cost estimate. The revised cost estimate was not included in the file.

The probability of a quotation exactly matching the revised cost estimate for each of the four tasks is highly suspect. Controls should have been in place to: (1) prevent the unauthorized release of the revised cost estimate, (2) document how and when the quotation was received, (3) assure that any revisions to project cost estimates are promptly provided to the responsible SCA and (4) detect the possibility of collusion. (See Audit Report KE-94-003, "SPC Subcontracting - Safeguarding Quotation Information," dated March 10, 1994.)

Subcontractor Compensated for a Mistake n Bid

The subcontractor for the Pad A Refurbishment Project was compensated for a mistake in bid without submitting the clear and convincing evidence required by FAR 14.407-4 that a mistake in bid was made. The subcontract file did not explain how the SCA verified that the required work was inadvertently omitted from the quotation price. The SCA never: 1) obtained the subcontractor's original worksheets used to prepare the bid; or 2) established legal entitlement to increase the price of the subcontract. Despite the lack of clear and convincing evidence, SPC Procurement negotiated the claim for $124,903.

The negotiation summary indicates the subcontractor and its subcontractor assured the SPC representatives that they had considered all aspects of the project. However, the 40 percent difference between the lowest-priced quotation ($3.2 million) and the next lowest quotation ($4,551,287) should have raised doubts

in the SCA's mind as to whether or not the subcontractor properly evaluated all factors.

The mistake in bid was identified as field change notice (FCN) No. 00 and was included as part of Supplemental Agreement (SA) No. 1. An FCN should be initiated by the Field Engineer (FE) for changes required by the SPC within the scope of the contract. The mistake is not an FCN and should not have been identified or processed as an FCN.

The SPC procedures do not require a legal opinion on matters such as a mistake in bid or large dollar change orders. There appears to be little incentive to perform such a review because there are no corporate funds involved. Contractual adjustments of this nature and value should be reviewed by the SPC legal counsel.

Despite the absence of convincing, objectively reviewable evidence from the subcontractor to show a mistake was made, the claim was negotiated for $124,903. We found nothing to support the payment of the $124, 903 claim. Therefore, the unsupported costs should be disallowed.

"Buying-In" (Changes Increased Subcontract Cost 90 Percent Over Original Award)

The Pad A Refurbishment Project required sandblasting, painting, and replacing corroded steel on Pad A. Without establishing legal entitlement, contract modifications increased the subcontract value from $3.2 million to $6.1 million, a 90 percent increase. KSC legal counsel, a KSC procurement official, and the SPC FE felt many of these modifications were unnecessary or excessively priced. The responsible SPC procurement officials did not exercise sufficient oversight to prevent the subcontractor from recovering his buying-in losses through change orders. The costs associated with the changes could have been reduced or avoided if the responsible SPC procurement officials had been more prudent in their oversight.

SOW Contained Vague Requirements

The SOW for the Pad A Refurbishment Project was not specific and contained ambiguous terms which left many areas open to interpretation. The subcontractor recognized these ambiguous terms as an opportunity to submit requests for equitable adjustment. These requests were submitted in the form of Requests For Information (RFI's) with supporting cost proposals.

Adequate review of the SOW is needed to ensure requirements are described in sufficient detail, clearly stated, and not ambiguous. If an adequate review of the SOW, Scope and Conditions, had been performed by the program manager, the SCA, or legal counsel, then ambiguities could have been detected and corrected prior to award. This would have reduced the subcontractor's opportunity to request additional compensation for unclear terms.

Recovery of Costs Through an Unconventional Process

RFI's (9 through 34) totaling $4.2 million remained pending at the completion of the Pad A Refurbishment Project in October 1993. SA No. 2 was issued in May 1994 for the amount of $1,827,273 to finalize and provide payment for these RFI's in question. Using RFI's as a means of recovering costs is an unconventional process. Although SA No.2 was negotiated from $4.2 million down to $1.8 million the supporting documentation was inadequate.

Conflicting Opinions Between Modification Management and Procurement

The SPC Modification Management did not perceive many of the RFI's as a change in scope to the original subcontract and, therefore, did not assign a corresponding FCN. The subcontractor notified the SCA of these accumulating disagreements on two occasions: letters dated August 9, 1993, and September 13, 1993. However, the subcontractor, as required by the subcontract, continued to work and completed the project with the RFI's pending.

The SPC Procurement's attitude concerning the unresolved RFI's was that the subcontractor was entitled to compensation because additional costs were incurred. Because agreement could not be reached between the SPC Procurement and the SPC Modification Management, an SPC cost estimator was asked to evaluate the RFI's and determine a target negotiation range. The SPC cost estimator's target was $1.5 million. A settlement of $1,827,273 was negotiated after numerous fact-finding sessions and extensive negotiation efforts. The subcontract file lacks the justification and supporting documentation necessary to support the subcontractor's claims.

Acceleration Effort Not Completed On Time

In an August 8, 1993, meeting, the SPC verbally directed the subcontractor to revise the original completion date of October 24, 1993, to October 15, 1993. This was done because the SPC

needed Pad A to be ready earlier than originally expected. No written direction of this change was found in the subcontractor file.

The acceleration change required the subcontractor to increase work hours from six 10-hour days to six 12- hour days to meet the new October 15, 1993, completion date. The subcontractor was initially paid $656,007 for this acceleration effort. The subcontract file contains a letter from the subcontractor dated October 29, 1993, stating that work was completed on October 24, 1993, and demobilization took place on October 25, 1993. Because the accelerated completion date was not met, the $656,007 should be disallowed.

Acceleration Payment (RFI 22) Exceeded Subcontract Value

To accommodate the subcontractor's request, special consideration was given to alleviate the financial burden of costs incurred for the acceleration effort. The SPC Procurement Manager verbally directed the SPC Accounts Payable to issue a check for $650,000 without a written supplemental agreement to the Pad A Refurbishment subcontract. Because prior payments had compensated the subcontractor for the entire subcontract amount, this payment exceeded the subcontract value and circumvented SPC procurement controls by the following actions: (1) Neither the required consent of the KSC Contracting Officer nor the Certificate of Certified Cost or Pricing Data were obtained, (2) The change order approval process was bypassed and formal negotiations were not conducted prior to payment, and (3) The SPC allowed the subcontractor to perform services without written authorization or direction to proceed.

The subcontractor explained that, as an SWOB, resources were not available to carry the financial burden of the project effort. SPC Procurement understood the subcontractor's position and paid the subcontractor $650,000 (prior to writing the subcontract modification) to help alleviate the hardship. Because of the SPC Procurement's eagerness to accommodate the subcontractor, it disregarded required procedures in order to expedite the payment.

SPC Procurement explained that the Certificate of Cost or Pricing Data and the KSC Contracting Officer's consent were not required because the price had not been negotiated in final. The subcontractor submitted a cost proposal to the SPC Procurement

and an invoice to the SPC Accounts Payable for $682,204. Prior to payment, SPC Procurement, SPC Modification Management, and the subcontractor agreed to change the invoice amount from $682,204 to $650,000. Agreement to adjust the invoice suggests that the price had been informally negotiated and, therefore, required certified cost or pricing data and the KSC Contracting Officer's consent.

In conclusion, the payment of $650,000 was made without establishing a valid obligation, increasing the subcontract value, or adhering to established procurement controls. KSC reimbursed the SPC the $650,000 before the supplemental agreement was issued.

Additional Costs Associated with the Acceleration Effort

The final negotiated cost of work related to the acceleration effort equaled $1.6 million, 135 percent higher than the originally estimated $656,007. (The $1.6 million is included in the RFI settlement {SA No. 2} of $1.8 million.) If the order to accelerate had been written timely, included a not-to-exceed price, and adequately addressed the terms regarding additional equipment, additional workers, loss of efficiency, and meeting the schedule prior to giving the notice to proceed, many of these additional acceleration costs (RFI's 25, 27, 28, 29, and 30) could have been avoided.

COSTS ASSOCIATED WITH THE ACCELERATION

RFI#	Description	Proposed	Negotiated
22	Acceleration	$682.204	$656.007
25	Efficiency Loss Due to Extended Hr.	$863,581	$331.556
27	On, Off, The Pad-Loss Time	$203,992	$ 59.474
28	Add'l Equipment for Acceleration	$410,266	$330,427
29	Direction for More Workers	$247.347	$127,353
30	Completed Level by Level	$186,350	$114,656
	TOTAL	**$2,593,740**	**$1,619,473**

Efficiency Loss (RFI 25) Due to Extended Work Hours

RFI 25 claims a decrease in production efficiency due to extended work schedules. The efficiency loss calculation is a standard formula from the Means Standard Manual. However, Modification Management's understanding was that the costs submitted for the acceleration effort ($656,007-RFI 22) were all

inclusive. The SCA felt that the subcontractor was entitled to some amount of efficiency loss and negotiated a settlement for $331,556. This efficiency loss should have been included as part of the acceleration costs associated with RFI 22 and not as an additional $331, 556.

Impact of (RFI 27) the Off-On Schedule Changes

The Pad A Refurbishment Project experienced five schedule changes during a one week period. Because of these schedule changes, the subcontractor alleged that additional costs were incurred. These schedule changes affected the momentum and efficiency of the job and resulted in the subcontractor's submission of requests for equitable adjustment (RFI 27) for additional labor and equipment costs. The subcontractor submitted cost proposals of $203,992 through the RFI process. The subcontractor and the SCA negotiated a price of $59,774 for the additional costs.

The SCA should have considered the impact of the off-on schedule changes prior to notifying the subcontractor to proceed. Work on Pad A was ordered off and then on again when only the possibility of a change in launch date existed. The verbal directions by the SCA caused the subcontractor to start and stop work unnecessarily resulting in additional costs of $59,474.

Additional Equipment (RFI 28) Needed for the Acceleration

RFI 28 references additional equipment needed for the acceleration effort. The SCA reviewed the subcontract proposal of $410,266 for additional equipment and, after numerous discussions with Modification Management, negotiated a settlement for $330,427. The subcontract file lacked sufficient justification and documentation to support this decision.

Additional Workers (RFI 29) for Paint "Holidays"

RFI 29 proposed $247,347 for additional workers needed for areas of unacceptable paint thickness or "holidays" as part of the acceleration effort. The supporting documentation does not show whether the need for additional workers is due to poor workmanship or the SPC direction to accelerate. The SPC was already paying for qualified workers to properly accomplish the required tasks. If the work was unacceptable, then the SCA and the FE were responsible to ensure that the subcontractor corrected the non-conforming work at no additional cost. Disregarding the fixed price procurement rationale, the SCA negotiated RFI 29 for $127,353. The subcontract file lacked sufficient justification and documentation to support this decision.

Additional Clean-up Costs (RFI's 31, 33, 34)

The subcontractor for the Refurbishment of Pad A was required to clean up after the sandblasting was complete. The subcontractor indicated additional cleanup was needed and submitted three RFI's (31, 33, and 34) which resulted in FCN No. 33 for $24,969. The subcontract file did not provide justification as to why the change was necessary when cleanup was included as part of the original terms of the contract or adequate documentation to support the additional costs. The additional costs of $24,969 for cleanup should be disallowed because the original subcontract required clean-up.

Remaining Sand Contaminates Pad A

Pad A was re-certified for use after the refurbishment effort. Subsequently, sand remaining on the pad blew into the payload changeout room and caused contamination. As a result, Space Shuttle Endeavour (STS-61) had to be moved from Pad A to Pad B to meet the target launch date. Costs associated with moving the shuttle ($344,421) were incurred. (These costs were in addition to this subcontract.)

The SCA, FE, and the subcontractor performed the walkdown and the Pad A Refurbishment effort was determined complete. If a more thorough walkdown had been performed by NASA and SPC officials, the additional cost $344,421 associated with moving the Shuttle could have been avoided.

PO No. 704220, Electrical Modifications

Recognized Contracting Rationale Was Not Followed To Determine Subcontract Value

The Electrical Modifications Project was awarded for $750,000 when the subcontractor's quotation was only $682,161. The SCA justified his decision to incorporate all available funds with the vague phrase that it is "in the Government's best interest." Documentation in the subcontract file did not explain what this phrase meant which left issues of whether a "Ceiling Price," a "Guaranteed Maximum Price," or some ordering limitation was actually intended.

The SCA explained that incorporating all the funds would not give the subcontractor an advantage because no money is guaranteed until the subcontractor performs. The SPC approved and KSC (Functional and Procurement) personnel consented to writing the subcontract for the amount of available funds $750,000 versus the amount of the lowest quotation $682,161.

The subcontract file is not clear as to whether any defined scope of work that was expected to be completed was ever documented either in house or with the subcontractor, prior to award. This constitutes a serious weakness in the subcontracting procedures/ methodology. If no definition of scope of work existed at the time of award, then the SPC should have negotiated a ceiling or guaranteed maximum price at the time each new increment of work was added. The subcontract file did not contain any Ceiling or Guaranteed Maximum Price.

If the SCA viewed the subcontract as a means to purchase labor hours and materials until funds were exhausted, then the SCA should have authorized work and payments incrementally. Although this approach is less than optimal, it can be an alternative. The SCA's rationale indicates serious weakness in contract approach.

Misapplication of Level of Effort Subcontract

Although the SPC is not required to follow all FAR requirements, it is required to use good business practices such as those in FAR. FAR 16-207 defines Fixed Price Level of Effort (FPLE) and provides specific requirements for issuance. The Electrical Modifications Project did not meet five of the six FPLE, FAR requirements.

1. An FPLE subcontract is suitable for investigation or study in a specific research and development area. *However, this project consisted of electrical modifications and energy conservation work, not research and development.*

2. The end product for an FPLE subcontract is usually a report showing results achieved through application of the required level of effort. *The end product for this award was not a report; the end product was the completed electrical and energy conservation construction modifications.*

3. To use an FPLE subcontract, an inability to define the required work must exist. *Because the SPC presumed that the required work could not be clearly defined, the SOW was stated in general terms. However, Modification Management subsequently drafted specific TOD's detailing the work required in designated areas. Detailed TOD's confirm that the required work could be clearly defined.*

4. When an FPLE subcontract is awarded, the required level of effort is to be agreed on in advance. *Although the SOW 1.4.1 describes the anticipated level of effort to be expended, it does not stipulate that these estimated hours are required to be expended.*

5. An FPLE-type subcontract may be used if there is reasonable assurance that the intended result cannot be achieved by expending less than the stipulated effort. *However, all tasks required under this subcontract were completed without expending the number of hours anticipated by the subcontract.*

6. The final criteria for using an FPLE subcontract is that the price must be $100,000 or less, unless approved by the chief of the contracting office. *This criteria was satisfied. Approval was obtained from the KSC Contracting Officer for this $750,000 subcontract.*

Application of a Time-and-Materials Subcontract

The Electrical Modifications subcontract corresponds more with the requirements of a Time and Materials (T&M) subcontract because of the type of "Proposal Form" used to solicit quotations. The Proposal Form contained five sections: Section 1 - Hourly Rates; Section 2 - Supplies; Section 3 - Small Tools and Expendables; Section 4 - Mobilization/Demobilization; and Section 5 - Field Supervision and Quality. Offerors were required to submit hourly rates, handling fee percentages, and lump-sum amounts. The wage rates were to include overhead, general and administrative expenses, and profit.

Because T&M subcontracts provide no positive profit incentive for cost control or labor efficiency, appropriate oversight of the subcontractor is required to give reasonable assurance that efficient methods and effective cost controls are being used. To ensure accurate cost submittals, subcontractors are required to provide evidence of costs incurred.

Purchase Orders's Submitted for Reimbursement of Material Costs

Although the subcontractor submitted acceptable evidence for reimbursable hours, material costs were reimbursed based on the subcontractor's submission of internally generated PO's. Acceptance of internal PO's in place of actual paid invoices is highly questionable and does not provide substantiating evidence

that materials were actually ordered, received, or paid for. Our comparison of the internally generated PO's to the actual invoices indicated costs of $38,005 were overbilled and truck expenses of $34,693 were unsupported.

The SPC FE responsible for overseeing the project requested actual invoices as evidence of incurred material costs. However, the SCA indicated that PO's were acceptable evidence. The SCA explained that actual invoices were not provided because this information was proprietary. The SPC's willingness to be denied actual invoices on the basis of information being proprietary, is inappropriate and unfounded.

We obtained the actual material invoices from the subcontractor and found the following issues.

1. Actual invoices for material costs were $38,005 less than the PO's submitted. This would indicate that the subcontractor overbilled for materials. Inflated material costs of $38,005 should be disallowed.

2. The subcontractor's "Purchaser" ordered and accepted delivery of materials. Performance of these two functions by one person gives no assurance that materials were actually ordered or received. An SPC representative should have independently verified that materials were delivered.

3. Costs for escorts ($34,412), additional trucks ($34,693), and overtime for supervisors ($1,054) were submitted with the PO's for material costs. Escort service is a labor hour activity, not materials. Escort requirements should have been anticipated by the SCA and covered by provisions in the subcontract solicitation. If escort requirements were in fact overlooked, then it is a large enough item to have been documented. Further, the possibility that the work should have been re-solicited, should also have been considered and documented. The subcontract file did not contain any record of how it was determined to include escort hours, truck expenses or overtime for supervisors under materials.

   Submitting these costs under the materials section and not the more appropriate sections (Sections 1, Hourly Rates, and

4, Mobilization/Demobilization) allowed the subcontractor to receive an additional 1 percent material handling fee ($702) on these costs. The additional material handling fee of $702 should be disallowed.

4. Truck expenses ($34,693) were not supported with adequate documentation. The subcontractor submitted a weekly memo claiming additional trucks were used to complete the task. These memos could not be independently verified to the daily logs, rental invoices (if trucks were rented), or industry standard means calculation (if the trucks were owned).

   The SOW Scope and Conditions 2.1.8 (c) states that the subcontractor was to provide all vehicles as part of a lump-sum mobilization and not on a reimbursable basis. An addendum No. 2 , no. 4 also re-emphasizes that vehicle cost was included in the lump-sum Section 4, Mobilization/ Demobilization. The subcontract file did not contain any supporting documentation to explain why truck expenses were being reimbursed when truck expenses were to be included in Section 4. Therefore, these truck costs of $34,693 should be disallowed.

Extending the Period of Performance

The period of performance was extended twice (14 days) on the Electrical Modifications Project, resulting in additional cost of $27,015, of which $6,240 was for Mobilization/Demobilization. The rational and the legal entitlement for allowing additional cost for Mobilization/Demobilization due to the extension is unclear. The subcontractor still was only required to make one mobilization and one demobilization. Additional costs for extended use of vehicles and other items included in the lump sum could have been justifiable. However, the subcontractor was already being reimbursed for vehicles through materials. Assuming vehicles were not included in the lump sum, the subcontract file contains no justification or documentation supporting why any cost over the reimbursable cost rates should be included in the cost of the extension. The $6,240 additional mobilization/demobilization costs should be disallowed for lack of the supporting documentation.

Escalated Costs Charged for the Extension

The price analysis performed by the SCA indicates that rates and factors proposed for the 14-day extension were equal to those submitted for the original subcontract. However, our calculations indicate an escalated cost was accepted for the extension for Sections 4 and 5. We assumed that since Sections 4 and 5 were lump-sum amounts, costs were allocated at a per day rate. The per day costs associated with the 14-day extension were 145 percent higher than the per day costs of the original subcontract.

The subcontractor justified the escalated rates as the means of recovering costs and profits that were sacrificed in the original subcontract. The subcontractor felt entitled to compensation since the basis for calculating the cost proposals was actual costs. The SCA believed the subcontractor provided a reasonable explanation and agreed with the change in methods.

The use of ambiguous wording in the SCA's price analysis memo gave false assurance that the higher costs for the extension were equal to those rates submitted for the original subcontract. Accepting escalated rates on change orders without supporting documentation encourages the subcontractor to submit inflated costs. At a minimum, escalated costs of $8,582 could have been avoided if stricter oversight had been administered.

Change Orders Issued Without Establishing a Not-To-Exceed Price

A change order relating to the Electrical Modifications Project was performed without negotiating a not-to-exceed price. The subcontractor completed the work and then submitted a cost proposal based on actual costs rather than estimated costs. Submitting a cost proposal after the work is completed gives the subcontractor no incentive to control costs and maintain productivity.

The subcontractor submitted three cost proposals, one prior to beginning the work $16,865, a second one when the work started $17,297, and a third one at completion $19,512. Subsequently, an additional fourth cost proposal of $2,916 was submitted for work that was verbally added to the subcontract. The subcontractor was paid $22,428 ($19,512+$2,916) for FCN 3.

The SCA reviewed the rates and factors, and the FE accepted the proposed quantity of materials and man-hours required. Because

no exceptions were taken, the SCA negotiated a price that equaled the subcontractor's final cost proposals for FCN 3.

The SCA should have established a not-to-exceed price if the FCN could not be negotiated before the work was complete. This would put the SCA in a favorable negotiating position and put a ceiling on the total cost that could be incurred for the change.

Competition Versus Subcontract Modification

FCN 3 ($22,428) was added on the FPLE subcontract even though FCN 3 was a change in scope. The SCA justified his decision to add on FCN 3 to the existing subcontract as opposed to letting a new competitive procurement, because it was administratively more convenient. Convenience is not acceptable justification for avoiding a new competitive procurement when there is a change in scope.

Adding a new work requirement onto a mobilized working subcontractor as opposed to competing the work takes advantage of mobilization of the existing subcontractor. This method is often the most cost efficient way to get the work done. However, there should be some analysis that shows the benefit and the price should be agreed upon in advance so that the benefits are known. It is imprudent to issue a change order without exploring prospective pricing.

Having the subcontractor perform additional work because of on-site presence is not adequate justification to avoid competition. Although it may be administratively more convenient, there is no assurance that the best price was obtained or that all qualified suppliers had an equal opportunity to submit quotations for the required services.

In determining whether competition or contract modification is most advantageous, a cost/benefit analysis should be performed. In this case, the SPC appears to have overpaid mobilization for the short extension (explained previously), undermining any argument that there was a savings involved in foregoing a competition and adding the work by modification.

PO No. 704215 and PO No. 704220

Inappropriate Determination of Subcontractor's Capability and Financial Responsibility

The SCA determined the subcontractor's capability and financial responsibility by reviewing a Dun & Bradstreet (D&B) report. The D&B report indicated the vendor had three employees and a net worth of $1,000. These facts caused us to question how this subcontractor was determined to be technically qualified and sufficiently financially responsible to be awarded $4.3 million in subcontracts during our audit period.

The SCA indicated that the subcontractor had the capability (financial, capacity, and quality considerations) to furnish the required supplies and/or services. Nothing in the subcontract file shows how this conclusion was reached except for the review of the D&B report. One could not reach this conclusion by reviewing the D&B report.

Preferential Treatment

In addition to the $650,000 payment described on page 23, the subcontractor received other preferential treatment not normally provided to subcontractors. The SPC Accounts Payable indicated that the SPC Procurement continually requested that the subcontractor be allowed to pick up checks instead of receiving them in the mail. In addition, the SPC Accounts Payable was routinely asked to issue checks manually for this subcontractor. The SPC Accounts Payable normally cuts checks twice a week and mails checks to vendors. These procedures prevent vendors from making special requests and allow the SPC Accounts Payable to operate efficiently. The consistent exception to these procedures for this particular vendor caused us concern regarding why this preferential treatment was provided.

False Certification

The subcontractor submitted written representation to the SPC certifying its status as an SWOB. The SPC Procurement is permitted to rely on the representation of SWOB status without verification. However, our review of the D&B report showed the following.

The subcontractor's date of incorporation (October 20, 1992) suggests the company may have been created as a women-owned entity as a result of the SPC informal construction set-aside rule. All the SPC construction projects were informally set aside for SDB's and SWOB's as of October 1992. Although the

subcontractor appears to be at least 51 percent owned by women, we question whether the women listed as owners are actively involved in the operation of the business.

Comments such as the "Olson girls" and that the company was set-up just to get subcontracts at KSC, also suggested that the subcontractor's certification of Small Women Owned Business (SWOB) may be false. Never seeing any documents signed by the women owners in the subcontract files reinforced our suspicion. However, because the SWOB program is self certifying and there was no protest at time of award the certification was accepted without question.

RECOMMENDATION 1

KSC should take the necessary administrative action to ensure the SPC Procurement and the SPC Modification Management are more effective and efficient in construction subcontract award and administration.

Management's Response

Management concured with our recommendation. In early 1994 management directed the SPC to take several actions to enhance it's procurement practices across the board and especially in the area of construction subcontract award and administration. KSC subsequently verified SPC actions taken to improve:

a. Controls for the Receipt, Handling and Safeguarding of Proposals.
b. Procedures and Controls for the Acquisition and Contract Administration Process.

The SPC was directed in October 1995 to make the following additional enhancements to its procurement practices by establishing formal procedures that require:

1. Detailed engineering estimates to support construction acquisitions.
2. Subcontractors substantiate claims for reimbursement with both vendor invoice and their payments.
3. Company counsel and the contracting officer's consent prior to contract adjustments for mistakes in contract after award.
4. Attendance records to document who was present during negotiations.
5. Taking extraordinary steps to ascertain the validity of the low offer when a wide variance exists.

6. Technical and procurement personnel document their rationale for recommendations and determinations as to whether a claim or an adjustment is subject to the "changes" clause.
7. Clear assignment and definition of the roles and responsibilities of both procurement and technical personnel for the use and administration of fixed rate, level-of-effort, time-and-materials types of contracts.
8. Training and sensitization of procurement and technical personnel as to their roles and responsibilities in the procurement process.

Evaluation of Management's Response

As a result of management actions and response, we consider this recommendation closed.

RECOMMENDATION 2

Ensure that procurement fraud indicators identified in this report have been satisfactorily addressed. *Since work is transitioning from the SPC to the successor contract, increased attention should be applied to construction subcontracts under the new contract.*

Management's Response

Management concurred with the recommendation and has taken the following actions:

1. Procurement personnel were provided copies of the DOD Office of Inspector General's briefing paper on "Indicators of Procurement Fraud" with a cautionary letter from NASA Headquarters Director of the Contracts Management Division sensitizing all of the necessity to be alert to such occurrences.
2. The Contracting Officer Technical Representative (COTR) training class was expanded to include a copy and discussion of the DOD OIG's briefing paper.
3. To enhance their objectivity in the review of KSC's on-site contractor acquisition activities, KSC's contractor procurement system review teams were expanded to include procurement professionals not involved in the administration of the contract under review.
4. KSC personnel responsible for consent of subcontracts issued by the local SFOC purchasing organization were made aware of concerns in the audit report and have been sensitized of the necessity for increased attention to construction subcontracts.

Evaluation of Management's Response

As a result of management actions and response, we consider this recommendation closed.

RECOMMENDATION 3

KSC should review the unsupported costs of $2,076,073 identified in this report and disallow at a minimum $885,519.

Management's Response

Management concurred with the recommendation. Subcontract changes and adjustments valued at $2,076,073 should be reviewed for reasonableness and allowability. It is KSC's intent to have this review conducted by qualified persons not previously involved in oversight or consent to SPC subcontracts. The recommendations of that review will form the basis for a determination by the KSC SPC Contracting Officer, with the advice of legal counsel, as to the reasonableness and allowability of each change and adjustment composing the $2,076,073. Those determined not to be allowable will be so acted upon.

Evaluation of Management's Response

We agree that a review by a qualified person who has not previously been involved in the oversight or consent of SPC subcontracts needs to be conducted to determine the reasonableness and allowability of each change and adjustment composing the $2,076, 073. This recommendation will be kept open until final determination of the $2,076,073 in unsupported cost is made.

Auditor's Note

Since the issues in this report have been referred for investigation, we request that KSC coordinate with the OIG prior to taking action on any decisions made regarding the monetary recommendations.

RECOMMENDATION 4

KSC should determine if the SPC should be held accountable for the additional cost incurred $344,421 (page 19) to move the Shuttle (STS 61) from Pad A to Pad B.

Management's Response

Management concurred with the recommendation and has reviewed the records of NASA's investigations subsequent to the incident. Discussions with personnel involved in the investigations concluded that the contamination resulted from breaches in the ceiling and walls of the payload changeout room (PCR) inside the payload changeout building. These breaches permitted contaminants from the spaces between the ceiling and walls to enter the PCR. Several causes for the breaches were

suspected, such as vibration of the PCR building in strong winds and vibration and flexing of the structure during movement or forces generated by launches.

The scope of the corrosion repair effort performed on Pad A did not include or require the clean-up of sand particles that penetrated the outer metal walls. Clean-up requirements applied to residual sand and other debris outside and around the structure. These areas were inspected and determined to be clean by NASA when the Pad A was re-certified for use before STS was moved to the Pad. Subsequently, before the payload was moved to the PCR, the PCR building was inspected by NASA contamination control teams, including the building exterior and surrounding area, the interior and the space above the suspended ceiling to the extent possible without entering the space. The PCR was certified as clean.

In summary KSC has determined that penetration of sand particles into the PCR building during sand blasting activities occurs and is unavoidable. KSC concluded that contamination of the PCR during the STS-61 flow by sand and other contaminants was a result of breaches in the integrity of the PCR ceiling and walls due to the "limitations and marginal conditions with the existing design." Since that time numerous modifications have been made and contamination control barriers have been put in place to increase margins and reduce risks of breaches.

Evaluation of Management's Response

We have reviewed management's response related to recommendation four. Based on our review of the detailed explanation and analysis of the investigative efforts subsequent to the incident, we agree that NASA should not hold the SPC accountable for the additional cost incurred ($344,421) to move the Shuttle (STS-61) from Pad A to Pad B. The penetration of sand particles into the PCR building during the sand blasting activities occurs and is unavoidable. As a result of management actions and response, we consider this recommendation closed.

MAJOR CONTRIBUTORS TO THIS AUDIT

Kennedy Space Center	Len Diamond, Audit Field Office Manager Maureen Phillips, Auditor-In-Charge Bonnie Armstrong, Auditor

FINAL REPORT DISTRIBUTION

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Senate Committee on Governmental Affairs
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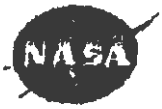
Management's Response

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899



Reply to Attn of: HM-CIC

NOV 2 2 1996

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

FROM: CD/Director

SUBJECT: Draft Audit Report on OIG Audit of Shuttle Processing Contract Subcontracting - Circumstances Indicating Procurement Fraud, Assignment Nos. A-KB-93-011 and A-KE-95-003

Regarding your letter dated October 16, 1996, subject as above, we have considered the four recommendations made in your draft report.

We are concurring in all recommendations.

Our specific comments are enclosed. Based on actions completed and planned by the cognizant KSC Directors and Support Contractors, recommendations 1, 2 and 4 are considered closed.

Jay F. Honeycutt

Jay F. Honeycutt

Enclosure(s)

cc:
CC/D. Schiller
DA/A. Parrish (w/o encl.)
DA-HTF/B. McCoy
DF/F. Durso
HM-CIC/J. Nary (w/o encl.)
OP/J. Mattaway, Jr.
OP-MSO/M. Krisberg
PH/R. Sieck
PH-B1/J. Bean
/T. Greer
HQ/HC/J. Horvath
W/OIG/L. Diamond (w/o encl.)

Management's Response

RECOMMENDATION 1

KSC should take the necessary administrative action to ensure the SPC Procurement and SPC Modification Management are more effective and efficient in construction subcontract award and administration.

KSC RESPONSE

Concur. (See enclosed comments from Director, KSC Procurement Office.)

RECOMMENDATION 2

KSC should ensure that procurement fraud indicators identified in this report have been satisfactorily addressed. *Since work is transitioning from the SPC to the successor contract, increased attention should be applied to construction subcontracts under the new contract.*

KSC RESPONSE

Concur. (See enclosed comments from Director, KSC Procurement Office.)

RECOMMENDATION 3

KSC should review the unsupported costs of $2,076,073 identified in this report and disallow at a minimum $885,519.

KSC RESPONSE

Concur. (See enclosed comments from Director, KSC Procurement Office.)

RECOMMENDATION 4

KSC should determine if the SPC should be held accountable for the additional cost incurred ($344,421 - page 27) to move the Shuttle (STS 61) from Pad A to Pad B.

KSC RESPONSE

Concur. (See enclosed comments from Director, KSC Procurement Office.)

Management's Response

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899

NOV 14 1996

Reply to Attn of: OP-MSO

TO: HM-CIC/Jim Nary

FROM: OP/Director, Procurement Office

SUBJECT: Draft OIG Audit Report No. KE-96-00X; Shuttle Processing Contract (SPC) Subcontracting-Circumstances Indicating Procurement Fraud

The subject report made four recommendations. The following comments apply.

RECOMMENDATION 1

KSC should take the necessary administrative action to ensure the SPC Procurement and the SPC Modification Management are more effective and efficient in construction subcontract award and administration.

COMMENTS

Since early 1994, KSC has taken several actions to enhance the SPC's procurement practices across the board and especially in the area of construction subcontract award and administration. The actions taken have been as follows.

a. Enhanced Controls for the Receipt, Handling and Safeguarding of Proposals.

In early 1994, the auditors conducting subject audit consulted with KSC procurement personnel regarding the SPC's practices in handling and safeguarding proposals. The KSC procurement personnel concurred with the auditors' concerns and directed the SPC to make several enhancements to their practices. The SPC implemented these enhancements via changes to its Procurement Manual on February 7, 1994. Subsequently, on March 10, 1994, the OIG issued Rapid Action Report KE-94-003, Shuttle Processing Contract Subcontracting - Safeguarding Quotation Information. The recommendation of the report had been resolved by the changes made to the SPC Procurement

Manual on February 7, 1994. The OIG considered the enhancements reflected by the changes to be responsive to their recommendation. In June 1994, KSC procurement personnel conducted a purchasing system review at SPC. The review included an examination of the SPC's practices to determine if they were in compliance with these changes to the SPC Procurement Manual. The review found that all files were correctly documented and fulfilled all requirements prescribed in the manual regarding the safeguarding of procurement information. A follow-up review in September 1994, again found practices in conformance.

b. Enhanced Procedures and Controls for the Acquisition and Contract Administration Process.

The subject audit was initiated by the OIG in late 1993. Two Rapid Action Reports were issued on March 10, 1994, Safeguarding Quotation Information (KE-94-003) and November 4, 1994, Undetected Procurement Fraud Indicators (KE-95-004). In August 1995, the OIG issued a discussion draft of their complete findings for KSC review. As a result of its examination of these findings, KSC concurred that corrective measures were required and in October 1995, directed the SPC to make the following enhancements to its procurement procedures and practices.

1. Formalize existing practices by establishing procedures including the requirement for detailed engineering estimates to support construction acquisitions. The procedures should include provisions addressing the sensitivity, control, and use of these estimates.

2. Procedures should be established or clarified to assure that payments to subcontractors for items under time and materials, level-of-effort, fixed rate task order, and other similar contracts which are based on actual costs are made based upon actual subcontractor payments and not purchase orders. Subcontractors should substantiate claims for reimbursement with both vendor invoices and their payments.

3. Procedures should be established consistent with the standards and policies reflected in FAR 14.407-4, Mistakes After Award, for the treatment and resolution of mistakes in contract, including review by company counsel. Include the requirement for consent by the Contracting Officer prior to contract adjustments for mistakes in contract.

4. File records documenting contract negotiations should clearly identify those present during the discussions and at the time agreements are reached. The use of attendance records is recommended. When final agreements are reached on such sensitive issues as price, schedules, prime contractor provided support, and others, it is especially critical that those present be identified when there may be a more limited group than that present for general discussions.

5. In those circumstances where a wide variance exists between the low offer and the next lowest offer, procedures should be established to take extraordinary steps to ascertain the validity of the low offer. In addition to the preaward conference to assure the offeror's understanding of the scope of work (and in the case of construction contracts site conditions), consideration should be given to request the low offeror to provide a manpower/cost summary sufficient to permit an analysis to validate that it reflects the appropriate resource requirements to accomplish the work. It should be compared to LSOC's engineering estimate. The objective should be to assure that the offeror understands the work and that LSOC understands the method proposed to accomplish it.

In those cases where the validity of an offer is examined via verbal discussion, the acquisition file should include a written record of the discussions documenting those objectively reviewable facts presented by the offeror which persuaded LSOC to conclude that the offer was valid.

6. In the area of contractor claims and adjustments, procedures should be expanded to clearly define the steps of the process and assign and explain the responsibilities of procurement and technical personnel. This should include the requirement for both technical and procurement personnel to document their rationale for recommendations and determinations as to whether or not a particular claim or adjustment is a change subject to adjustment under the "Changes" clause. Both procurement and technical personnel frequently involved in these activities should be trained in the operation and interpretation of the "Changes" clause. The process and file documentation should clearly distinguish between (1) the issue of whether or not a claim is a change subject to adjustment under the "Changes" clause, and (2) the value of the adjustment. Legal review of contract adjustments

Management's Response

under the "Changes" clause at appropriate dollar levels is recommended.

7. Procedures should be developed for the use, source selection, administration and control of "fixed rate," level-of-effort, time and materials, and similar contracts. Said procedures should clearly assign and define the roles and responsibilities of both procurement and technical personnel. Particular attention should be directed to assure that contract administration and work progress controls focus on assuring effective and efficient accomplishment of task orders within previously established resource agreements.

These forms of contracts should not be used when the work can be sufficiently defined as to be accomplished via fixed price contracts. All contracts of these types should be submitted for Contracting Officer consent.

8. Several of the above areas of concern affect the activities of LSOC technical personnel who are important participants in the acquisition and contract administration processes. As part of your examination and the enhancements developed, you are requested to provide a plan for the initial and continued training and sensitization of technical personnel as to their role and responsibilities as part of these processes.

In response to the above direction, the SPC amended their procedures and practices to comply with these enhancements. In September 1996, KSC procurement personnel conducted a review of 100 percent of the construction subcontracts awarded by the SPC during 1996. The review included an examination as to whether or not the SPC's practices complied with the enhanced requirements, and verified that indeed they did. However, the review recommended that file documentation supporting entitlement determinations on claims include appropriate rationale as an adjustment under the "Changes" clause. The claims allowed were appropriately justified, but the documentation rationale did not explicitly include language referring to the "Changes" clause.

Among the enhancements to which the SPC committed was increased training for its procurement and technical personnel. During the period since, training has been provided as follows:

Management's Response

ATTENDEES/ COURSE NAME	DURATION	INSTRUCTOR
All LSOC employees within	2 hours	Lockheed Martin Corporate
Technical & Procurement Personnel		
CTM/COTR Training	4 hours	C. Byrd & R. Nelson, LSOC
Changes/Claims/Disputes	4 hours	George Washington Univ.
Procurement Personnel		
Negotiation	3 days	George Washington Univ.
Construction Contracting	3 days	Federal Publications, Inc.
Prevailing Wage & SCA	2 days	Department of Labor
Underground Storage Tank & Above Ground Cleanup	8 hours	Florida Department of Environmental Regulation
Subcontracting (including SOW development)	20 hours	George Washington Univ.

The KSC procurement review in September 1995, recommended that appropriate technical personnel also receive training in SOW development/requirement identification.

RECOMMENDATION 2

Ensure that procurement fraud indicators identified in this report have been satisfactorily addressed. *Since work is transitioning from the SPC to the successor contract, increased attention should be applied to construction subcontracts under the new contract.*

COMMENTS:

The OIG's concerns about fraud indicators were conveyed to KSC informally in September 1994, via a draft audit report. The formal report was issued on November 4 1994, (KE-95-004, Undetected Procurement Fraud Indicators) and included KSC's response which addressed the OIG's concerns. The actions taken by KSC included providing all of its procurement personnel copies of the DOD Office of Inspector General's briefing paper on "Indicators of Procurement Fraud" with a cautionary letter from NASA Headquarters Director of the Contract Management Division sensitizing all of the necessity to be alert to such occurrences. In addition, the Contracting Officer Technical Representative (COTR) training class regularly presented at KSC was expanded to include a copy and discussion of the DOD OIG's briefing paper. All KSC COTR's

and contract specialists are required to take this class. In order to enhance objectivity in the review of KSC's onsite contractor acquisition activities KSC's contractor procurement system review teams have been expanded to include procurement professionals not involved in administration of the contract under review.

The SPC was succeeded by the Space Flight Operations Contract (SFOC) on October 1, 1996. A portion of the subcontracting done by the SFOC contractor (United Space Alliance) will be accomplished by a SFOC purchasing organization located at KSC. Although the SFOC is a Johnson Space Center contract, KSC has been delegated responsibility for consent to the placement of subcontracts issued by the local SFOC purchasing organization. The KSC personnel assigned this responsibility have all received copies of the DOD OIG's briefing paper, are aware of the concerns reflected by subject audit report, and have been sensitized of the necessity for increased attention to construction subcontracts.

RECOMMENDATION 3

KSC should review the unsupported costs of $2,076,073 identified in this report and disallow at a minimum $885,519.

COMMENTS

KSC concurs that the subcontract changes and adjustments valued at $2,076,073 should be reviewed for reasonableness and allowability. It is KSC's intent to have this review conducted by qualified persons not previously involved in oversight or consent to SPC subcontracts. The recommendations of this review will form the basis for a determination by the KSC SPC Contracting Officer, with the advice of legal counsel, as to the reasonableness and allowability of each change and adjustment composing the $2,076,073. Those determined not to be allowable will be so acted upon.

RECOMMENDATION 4

KSC should determine if the SPC should be held accountable for the additional cost incurred $344,421 (page 37) to move the Shuttle (STS 61) from Pad A to Pad B.

Management's Response

Comments

The OIG report on pages 15 and 27 states that the required cleanup accomplished by the subcontractor after the refurbishment effort was performed unsatisfactorily. Although not stated explicitly, the context of the OIG's comments imply that the unsatisfactory condition was a failure of the subcontractor to clean up residual sand from the sandblasting activities and a failure of the prime contractor and NASA personnel to adequately inspect the Pad and identify the residual sand. The OIG concludes that this residual sand "blew into the payload changeout room and caused contamination." The OIG's description of the mechanism of contamination (namely wind blown residual sand) is speculative and is not supported by the results of NASA's investigations conducted subsequent to the incident. For several months after the contamination incident, the problem was investigated by NASA and contractor personnel representing payloads operations, mechanical systems engineering, contamination control engineering and ground engineering. Review of the record of these investigations and discussions with the personnel involved found that it was the conclusion of the investigators that the contamination resulted from breaches in the ceiling and walls of the payload changeout room (PCR) inside the payload changeout building. These breaches permitted contaminants from the spaces between the ceiling and walls to enter the PCR. Several causes for the breaches were suspected, such as vibration of the PCR building in strong winds and vibration and flexing of the structure during movement or from forces generated by launches. A principal source of contaminants was from the space above the PCR's suspended ceiling. The ceiling panels, ducts and fixtures were believed to be adequately fitted and interfaces sufficiently sealed to prevent contaminants (paint flakes, dust, rust particles, insulation fragments, particles intruding through breaches in the metal roof, etc.) from entering the PCR. However, examples of the breaches that were discovered included a conduit that fed through the ceiling found to have been pulled down breaking the seal between the conduit and ceiling, gaps at the wall to ceiling interface, and an incompletely sealed sprinkler head. Among the contaminants in the spaces beyond the ceiling and walls is the sand used when the metal exterior surface of the PCR building is sandblasted as part of corrosion repairs. This sand penetrates the structure as a result of the high pressure sandblasting process through seal cracks between plates,

Management's Response

interfaces at corners, conduits and utility accesses, and other "weak points" in the outer metal walls. The investigators did not consider it possible that wind blown sand (whether residual sand from sandblasting or the sand all around the Pad) could penetrate the outer metal walls of the PCR building. The scope of the corrosion repair effort performed on Pad A did not include or require the cleanup of sand particles that penetrated the outer metal walls. Cleanup requirements applied to residual sand and other debris outside and around the structure. These areas were inspected and determine to be clean by NASA when Pad A was re-certified for use long before STS-61 was moved to the Pad. Subsequently, before the payload was moved to the PCR, the PCR building was inspected by NASA contamination control teams, including the building exterior and surrounding area, the interior and the space above the suspended ceiling to the extent possible without entering the space. The PCR was certified as clean.

In summary KSC has determined that penetration of sand particles into the PCR building during sand blasting activities occurs and is unavoidable. This is supported by the fact that despite taking extraordinary measures to prevent this from happening during the same corrosion repair activity recently performed on the Pad B PCR building, penetration of sand particles occurred. Also, despite several efforts to remove the sand and other contaminants from the space above the ceiling in the Pad A PCR, only approximately 90 to 95 percent cleanliness was achieved. KSC concluded that contamination of the PCR during the STS-61 flow by sand and other contaminants was as a result of breaches in the integrity of the PCR ceiling and walls due to the "limitations and marginal conditions with the existing design.". Since that time numerous modifications have been made and contamination control barriers put in place to increase margins and reduce risks of breaches.

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