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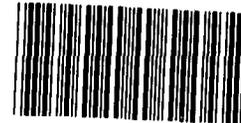
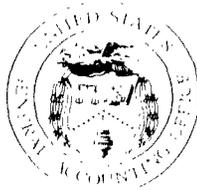
United States General Accounting Office

Briefing Report to the Chairman,
Subcommittee on Investigations and
Oversight, Committee on Science, Space,
and Technology, House of Representatives

April 1992

SPACE STATION

Contract Oversight and Performance Provisions for Major Work Packages



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**National Security and
International Affairs Division**

B-247885

April 14, 1992

The Honorable Howard Wolpe
Chairman, Subcommittee on
Investigations and Oversight
Committee on Science, Space, and
Technology
House of Representatives

Dear Mr. Chairman:

As you requested, we reviewed selected aspects of the National Aeronautics and Space Administration's (NASA) management of the three work package contracts for Space Station Freedom. Specifically, we reviewed how the NASA centers managing each of the contracts responded to Federal Acquisition Regulation (FAR) requirements for post-award contract administration and quality assurance planning conferences and for quality assurance plan development, review, and approval. In addition, we identified the award fee provisions of these contracts, the amounts of fees awarded, and contract provisions related to the performance of contractors' products. The results of our preliminary work were presented in a briefing to your staff in November 1991. This report updates and provides additional details on the information contained in that briefing.

Background

The three space station work package contracts were initially awarded in December 1987 by the Marshall Space Flight Center, the Johnson Space Center, and the Lewis Research Center. Marshall Space Flight Center, located in Huntsville, Alabama, is responsible for the contract with Boeing Aerospace for the design and manufacture of the habitation and laboratory modules at Boeing's Huntsville facility; the Johnson Space Center near Houston, Texas, is administering the contract with McDonnell Douglas Space Systems Company in Huntington Beach, California, for the design and manufacture of the truss assembly; and the Lewis Research Center, Cleveland, Ohio, is administering the contract with the Rocketdyne Division of Rockwell International in Canoga Park, California, for the station's electrical power system.

The FAR provides the policies and procedures that government agencies are to follow in performing contract administration functions. The FAR also prescribes the policies and procedures for delegating contract administration functions to another agency. All three NASA centers delegated some contract administration functions to the Defense Contract

Management Command (DCMC), an organization of the Department of Defense's Defense Logistics Agency.

NASA's contracting offices are required to hold a post-award planning conference with DCMC representatives to discuss the contract administration functions to be delegated and how they will be accomplished. A similar conference is also required when the quality assurance function is delegated. When quality assurance is delegated, each DCMC office is required to prepare a quality assurance plan—a written strategy for assuring that the contractor's products and services conform to applicable requirements and specifications set forth in the contract. This plan must be reviewed and approved by NASA.

Results in Brief

All of the required contract administration and quality assurance planning conferences were held. Also, each DCMC office prepared and submitted the required quality assurance plans, which were reviewed and approved by the appropriate NASA center.

All three work packages are under cost-plus-award-fee contracts. The work package prime contractors have earned approximately \$80.3 million, or 86 percent, of the \$93 million in award fees that were available to be earned through fiscal year 1991. The percentages of award fees earned by the three contractors have varied from a low of 69 percent to a high of 93.8 percent of the award fee available for the 18 award fee periods—6 on each contract—since their inception.

Various provisions in the three work package contracts address the performance of contractor-furnished hardware and NASA's recourse should these items fail to perform as specified. In general, the contractor has to repair or replace any item that does not conform to contract specifications for up to 6 months after acceptance by the government as long as the government pays the cost to do so. Under the Marshall contract with Boeing, however, the contractor has agreed to pay the cost of repairing or replacing any items accepted by the government that are found to be defective before launch. This contract also contains a provision concerning the failure of either a habitation or laboratory module to function on orbit. The contractor agrees to forfeit one-half of all previously earned award fees when certain conditions are met.

In addition, the Marshall contract will base part of the award fee on the on-orbit performance of the contractor's product. Lewis is currently

negotiating the addition of award fees based on on-orbit performance to its work package contract. There are no similar on-orbit performance provisions in, or planned for, the Johnson contract.

Delegations and Planning for General Contract Administration

Part 42 of the FAR sets out the requirements that government agencies must observe in performing contract administration functions. The FAR also prescribes the policies and procedures for obtaining interagency contract administration assistance from the Department of Defense through its field offices located at or near a contractor's facilities to avoid duplication of government effort and provide efficient oversight of government contractors.

Each NASA center is responsible for determining the extent to which contract administration functions are delegated. The centers are also responsible for determining the extent of quality assurance functions to be performed by DCMC. NASA requires that certain procedures be followed when contract administration and quality assurance functions are delegated, and we found that all three centers complied with these procedures.

All three NASA centers—Marshall, Johnson, and Lewis—requested DCMC to perform some of the 77 contract administration functions outlined in the FAR, including such areas as production administration, property administration, plant clearance, transportation, and quality assurance. These functions are the responsibility of DCMC contract administration and quality assurance personnel located at the contractors' facilities.

NASA's supplement to the FAR required NASA to hold a post-award planning conference with DCMC representatives to discuss the contract administration functions to be delegated and how they would be accomplished.

Marshall Space Flight Center held two planning conferences. At the time of the first conference, the DCMC office in Huntsville, Alabama, did not have sufficient staff to adequately administer the contract. Marshall personnel held a second conference to request the assistance of DCMC's office in Birmingham, Alabama, which performed most of the contract administration functions until they could be assumed by the Huntsville office. These functions are now being performed by the Huntsville office. Johnson Space Center officials held a series of meetings with DCMC staff concerning the delegation of contract administration responsibilities.

Lewis Research Center officials held a formal 2-day conference with DCMC officials to discuss contract administration.

Following the post-award planning conference, each NASA contracting office prepared and forwarded a "Letter of Contract Administration Delegation, General" to the DCMC contract administration office for its concurrence and acceptance. The letter designated those contract administration functions that were agreed to during the post-award planning conference to be performed by DCMC.

Planning for Quality Assurance Oversight

NASA Handbook 5300.4(2B-1), Quality Assurance Provisions for Delegated Government Agencies, establishes the requirements to be met by the NASA contracting office, DCMC personnel, and any NASA official performing quality assurance functions. The contracting offices are required to hold a quality assurance planning conference with officials of the DCMC office who will be responsible for executing the quality assurance functions. Each DCMC office is also required to prepare a quality assurance plan—a written strategy for assuring that the contractor's items and services conform to applicable requirements and specifications set forth in the contract. This plan is required to be reviewed and approved by the NASA contracting office.

All of the DCMC offices submitted quality assurance plans to the respective NASA centers where they were reviewed and approved. The quality assurance plans addressed those procedures and processes that would be used to monitor the contractor's planning, processes, and overall product quality. The plans included an organization chart and qualifications summary of the DCMC quality assurance staff, as well as a description of how DCMC officials would monitor, test, and evaluate the contractors' operations and report the results to NASA.

The Monthly Quality Status Report is a reporting requirement that is prepared by the DCMC office and forwarded to the NASA resident office at the contractor's facility. This report is intended to provide NASA with information on circumstances affecting the status, performance, or quality of an item; contractor performance; and DCMC personnel working on the NASA contract. For example, the report can discuss nonconformance or inadequate compliance with contract provisions, describe changes in the contractor's quality assurance program or inspection system, provide a summary of articles inspected and tested, and comment on the progress of the overall contract. The report can also address changes in demands for

DCMC personnel as a result of changes in contractor production rates, DCMC work force status regarding the number of hours expended during the reporting period, and the status of and progress in completing specialized training for DCMC staff.

We contacted the DCMC contract administration representative and quality assurance representative at each of the contractors' facilities to verify their understanding of the functions that had been delegated. The three contract administration representatives confirmed their understanding of the contract administration functions that NASA had delegated to DCMC. The quality assurance representatives were equally certain of their assessments of the quality assurance functions that had been delegated. In all cases, these individuals expressed satisfaction with their working relationship with NASA contracting office personnel.

Award Fee and Other Performance Provisions

An award fee, part of the total value of the space station work package contracts, is intended to motivate the contractor to perform above a minimum level of effort. In addition, several of the work package contracts contain nonstandard provisions that afford the government recourse if contractor-furnished products fail to meet contract specifications or fail to perform on orbit.

All three of the prime space station work packages are under cost-plus-award-fee contracts. The total value of these contracts is comprised of an estimated cost, a base fee, and an award fee, as shown in table 1.

Table 1: Estimated Space Station Work Package Contract Values Through Fiscal Year 1991

NASA contract	Total estimated cost	Total base fee	Maximum award fee	Total value of contract ^a
Marshall/ Boeing	\$2,468,305,969	\$39,204,046	\$109,907,927	\$2,617,417,942
Johnson/ McDonnell Douglas	3,294,095,796	57,878,593	184,381,784	3,536,356,173
Lewis/ Rocketdyne	1,723,379,241	63,411,918	82,623,261	1,869,414,420
Total	\$7,485,781,006	\$160,494,557	\$376,912,972	\$8,023,188,535

^aThese totals include amounts carried over from initial fixed-fee letter contracts. The contract values shown do not reflect revised values based on renegotiated contracts that have not yet been finalized.

The estimated cost is the cost that both the contractor and the government agree to be the most realistic estimate for completing the necessary work, based on existing knowledge of the work to be done. The base fee, which is

generally 2 percent to 3 percent of the estimated cost, is intended to compensate the contractor for minimum performance. The award fee is intended to motivate the contractor's performance based on one or more of the following criteria as specified by NASA: technical ability; safety, reliability, maintainability and quality assurance; schedule; project management; and business management/cost control.

The contractor's performance is evaluated by a Performance Evaluation Board (PEB) at 6-month intervals. The performance criteria are weighted by the PEB for each evaluation period, according to the emphasis NASA wants on the work scheduled to be completed during that period. From the inception of each of the work package contracts, technical ability has been the most heavily weighted award fee criterion. According to one center contracting official, emphasis will likely shift from technical ability to cost and schedule considerations as work progresses from design and development into production.

Contractors are informed at least once during the evaluation period of the PEB's assessment of their performance. Within 45 days after the evaluation period, the PEB prepares a written report with recommendations for the numerical score and corresponding adjective rating it believes the contractor has earned during the period. These scores and ratings determine the percent of available award fee that will be awarded for that period. These assessments are sent to the contractors who can contest them and provide the support and the rationale for their positions.

PEB evaluation reports and contractors' documentation for any contested evaluations are forwarded to the Award Fee Determination Board (AFDB) that is chaired by the Director, Space Station Freedom. The AFDB determines the award fee to be paid, based on the PEB's assessment and recommendations, and any contractor documentation. This determination is final and cannot be challenged by contractors. Table 2 shows the award fees earned through fiscal year 1991 by each space station work package contractor.

Table 2: Award Fees Earned by Work Package Contractors Through Fiscal Year 1991

Contract	Award fee	Rollover ^a	Total fee available	Total fee earned	
				Amount	Percent
Marshall/Boeing	\$22,216,228	\$680,542	\$22,896,770	\$18,516,892	80.9
Johnson/McDonnell Douglas	42,077,858	1,000,000	43,077,858	39,047,792	90.6
Lewis/Rocket-dyne	24,519,669	2,966,334	27,486,003	22,714,891	82.6
Total	\$88,813,755	\$4,646,876	\$93,460,631	\$80,279,575	85.9

^aRollover is a portion of an unearned award fee that is set aside in a reserve pool. The government unilaterally determines whether to make any portion of the reserve available to be earned by the contractor in a subsequent evaluation period. The availability of roll-over funds in a subsequent period is usually linked to the contractor's accomplishment of specific criteria/tasks.

As table 2 indicates, the contractors have earned an average of between 81 percent and 91 percent of the total award fee available through fiscal year 1991. The percentages of award fees earned by the contractors have varied from a low of 69 percent to a high of 93.8 percent of the award fee available for the 18 award fee periods since the initiation of the three contracts.

Each of the three prime contracts also contains a FAR provision whereby at any time during contract performance, but no later than 6 months after acceptance of all of the end items delivered under the contract (or such other time as may be specified in the contract), the government may require the contractor to replace or correct work not meeting contract requirements. Generally, it is the government's responsibility to pay for repair or replacement. This approach to correcting defects in materials and workmanship has been modified under the Marshall/Boeing contract. This contract includes a provision stipulating that the contractor is responsible for repairing or replacing any item accepted by the government that is found to be defective prior to launch. The contractor's cost under this provision is generally limited to the cost of the defective item only. The contractor is not responsible for the cost of related activities, such as identifying the defective item; removing it from its flight element; performing failure analyses; and redesigning, retesting, and requalifying it.

The Marshall/Boeing contract also contains a provision related to the on-orbit performance of the contractor's product. This provision was proposed by the contractor, and it stipulates that Boeing will forfeit one-half of all previously earned award fees if its habitation or laboratory

module does not function properly on orbit because it failed to comply with contract specifications and the operating failure lasts for longer than one logistical resupply cycle—currently 90 days. In our opinion, this provision is enforceable; although, as a Marshall official pointed out, its enforcement would put the burden of proof on NASA to show that an on-orbit failure met all the attendant conditions, should the contractor contest the government's claim.

Marshall and Lewis have added, or are in the process of adding, award fee provisions relating to the on-orbit performance of contractor-furnished items. Marshall Space Flight Center has reserved over \$11 million, or approximately 10 percent of the total award fee, for the on-orbit performance of the habitation and laboratory modules. Lewis Research Center is currently negotiating the addition of three more award fee periods to the Rocketdyne contract to provide an incentive to the contractor for on-orbit performance. Under the current proposal, the contractor would be assessed for an award fee at the time the power system is successfully activated on orbit; another award fee 3 years after activation; and the final award fee 5 years after activation. The Johnson Space Center's contract with McDonnell Douglas does not have any on-orbit performance incentives, and there are no plans to add such incentives.

Scope and Methodology

For each work package contract, we reviewed the contract administration delegation letters, quality assurance plans, and selected Monthly Quality Status Reports. In addition, we reviewed relevant sections of the FAR and NASA's supplement to the FAR, as well as NASA's quality assurance handbook. We discussed with NASA officials the contract administration functions, the delegation process, and the responsibilities that were delegated to DCMC. We also contacted appropriate DCMC personnel to confirm their understanding of the contract administration and quality assurance functions that had been delegated by NASA. We obtained information on the award fee provisions and award fee histories on each contract, and identified contract provisions related to the failure of contractors' products to perform as expected.

All of the contract information in this report is based on the work packages before their revision reflecting redesigned space station restructuring in early 1991. The negotiation of each work package contract to reflect the redesigned and rephased station has not yet been completed.

We conducted our review from May 1991 to March 1992 in accordance with generally accepted government auditing standards. As requested, we did not obtain written agency comments on this report. However, we discussed our draft report with agency officials and have included their comments where appropriate.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time, we will send copies to the NASA Administrator, the Secretary of Defense, and appropriate congressional committees. Copies will also be made available to other interested parties on request.

Please contact me on (202)275-5140 if you or your staff have any questions concerning this report. The major contributors to this report are Frank Degnan, Assistant Director; Lawrence A. Kiser, Senior Evaluator; and Roberta Gaston, Evaluator.

Sincerely yours,



Mark E. Gebicke
Director, NASA Issues



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