



GAO

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United States General Accounting Office  
Washington, DC 20548

National Security and  
International Affairs Division

B-284721

May 11, 2000

The Honorable F. James Sensenbrenner, Jr.  
Chairman  
The Honorable Ralph M. Hall  
Ranking Minority Member  
Committee on Science  
House of Representatives

Subject: Space Station: Prime Contract Changes

The National Aeronautics and Space Administration (NASA) and its international partners—Japan, Canada, the European Space Agency, and Russia—are building the International Space Station as a permanently orbiting laboratory to conduct materials and life sciences research, earth observation, commercial utilization, and related activities under nearly weightless conditions. Each partner is providing station hardware and crew members and is expected to share operating costs and use of the station. The NASA space station program manager is responsible for the cost, schedule, and technical performance of the total program. The Boeing Corporation, the prime contractor, is responsible for development, integration, and assembly of the station. The prime contract was valued at \$5.6 billion when it was signed in January 1995, and is currently budgeted at \$10.2 billion with a scheduled completion date of August 2004.

You have expressed concern about the growing costs of the space station and NASA's efforts to control them. This report responds to your request for information on changes made to the prime contract during fiscal years 1998 and 1999. Specifically, you asked us to identify (1) the number of changes made to the original contract, how many added capability or revised initial designs, and the total estimated cost of the changes; (2) the number of changes that either added capability or revised initial designs and for which work began before NASA and the contractor agreed on a cost estimate and their total estimated cost; (3) the difference between the proposed and final negotiated costs of changes for which work began before NASA and the contractor agreed on a cost; and (4) instances in which NASA spent funds for space station enhancements that were not called for in the original contract's baseline design and are not currently included in NASA's space station program budget.

RESULTS IN BRIEF

In fiscal years 1998 and 1999, NASA authorized 593 changes to the space station prime contract for a total estimated cost of \$897.7 million. Of these, 280 changes added capability or revised initial designs. Changes that added capabilities were made to increase the station's operational performance, especially in meeting research needs. Revisions of initial designs included changes to correct operability deficiencies; correct design deficiencies; and reduce cost, schedule, and technical risks. The total estimated cost of changes made to add capabilities and revise initial designs was \$368.1 million.

NASA officials can authorize work to begin on a contract change before NASA and the contractor agree on a final estimated cost and fee. These are referred to as undefinitized contract actions. Federal Acquisition Regulation and current NASA policy state that work on contract changes which have not been negotiated should occur on an exception basis and be limited to urgent requirements. In the past, both NASA's Office of Inspector General and we have reported concerns about NASA's frequent use of undefinitized contract changes. During this review we found that in fiscal years 1998 and 1999 undefinitized contract changes accounted for more than one-half of all authorized changes, and 98 percent of their cost. Thus, NASA continued to use undefinitized changes for the large majority of change costs on the space station prime contract. NASA officials said that because the space station program is complex and is nearing completion of the design, development, test, and evaluation stage of the program, the agency expects many urgent changes in the future. NASA officials also said they recognized that beginning work on contract changes which have not been negotiated is not the preferred way of doing business because the cost of the change is unknown while the work is being done. The officials explained that they began work on undefinitized changes to avoid delaying the space station program schedule, modify ongoing work, or reduce the cost of a change by taking advantage of other ongoing work.

As of September 30, 1999, NASA and Boeing had reached agreement on costs for 156 of the 187 changes for which work had begun before a final estimated cost was negotiated. The data NASA provided on proposed and negotiated costs for these contract changes contained errors that would have imposed significant demands on space station program officials' time to correct. To address this problem and provide some insight into this issue, we obtained and analyzed data for the five highest-cost undefinitized changes. These changes involved contractor-proposed costs of about \$69.0 million. As of September 30, 1999 NASA officials had completed negotiations for three of these changes. In these three cases, the negotiated costs were lower than the contractor's initial proposal. In two of the cases, negotiated costs were approximately 20 percent lower than the contractor's proposal; in the third case, a reduction of \$220.9 million was made to the prime contract by the deletion of the space station Habitation module, which was intended to provide crew living quarters.

NASA identified four activities costing about \$19.4 million that will provide enhancements to the space station that were not included in the original contract or in NASA's space station program budget. For example, NASA estimates that it will spend \$15.9 million to support the operation of a Department of Energy science instrument on the station. Although these activities are being implemented outside the space station program, their results will provide enhancements to the space station. NASA explained that these activities were never intended or required to be part of the space station prime contract.

Further details on our findings are provided in enclosure I.

### SCOPE AND METHODOLOGY

To obtain information about what space station contract changes were made, why the changes were made, and how much they cost, we met with officials and obtained data from the station program office at NASA's Lyndon B. Johnson Space Center in Houston, Texas. Because all data was not readily available for all contract changes, we obtained and analyzed data for the five highest cost changes. These five changes had a total estimated cost of \$69.0 million, or 7.8 percent of the estimated \$879.7 million cost of all 316 undefinitized contract actions. To obtain information about instances in which NASA expended funds for space station enhancements that were not called for in the original contract's baseline design and are not currently included in NASA's space station program budget, we met with and obtained information from officials at NASA headquarters. We did not independently verify the information provided by NASA. We conducted our review from September 1999 through February 2000 in accordance with generally accepted government auditing standards.

### AGENCY COMMENTS AND OUR EVALUATION

NASA's Associate Deputy Administrator provided comments on a draft of this report. Specifically, NASA commented that the number and total value of undefinitized contract changes to the original space station contract has been steadily declining over the past three years. NASA commented, however, that it anticipates having many urgent changes as the space station program continues, and that all contract changes will continue to receive management attention.

We agree that that the number of undefinitized contract changes actions has been declining. The decline is due in part to new procedures, implemented in November 1998, under which the space station program office stopped issuing such actions for administrative changes that did not affect the technical content and cost of the original space station contract.

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NASA also provided technical comments, which we incorporated where appropriate. NASA's comments and our responses are provided in Enclosure II.

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Unless you publicly announce its contents earlier, we plan no further distribution of this letter until 14 days from its issue date. At that time we will send copies to the Honorable Daniel S. Goldin, Administrator, NASA, and the Honorable Jacob J. Lew, Director, Office of Management and Budget. We will also make copies available to others upon request.

If you have any questions about this letter, please contact me on (202) 512-4841 or Jerry Herley, Assistant Director, on (202) 512-7609. Major contributors to this letter were Jeffery Webster, Lorene Sarne, and Dorian Dunbar.



Allen Li  
Associate Director  
Defense Acquisitions Issues

## CHANGES TO THE INITIAL SPACE STATION PRIME CONTRACT

**Question 1: During fiscal year 1998 and 1999 how many changes to the original January 1995 prime contract did NASA make, and what is the total estimated cost of these changes? How many of these changes were made to add capability or revise initial designs, and what is their total estimated cost?**

During fiscal years 1998 and 1999, NASA approved 593 changes to the International Space Station prime contract, which are estimated to cost \$897.7 million. Of that amount, 280 of the changes, estimated to cost \$368.1 million, authorized work for adding capability or revising initial designs.

At our request, NASA officials grouped the 593 changes into one of seven categories that describe why the changes were made using definitions of the categories jointly agreed to by NASA and us. Four categories describe changes that add capability or revise initial designs; the other three categories do not. The first four categories are:

- **New capability:** Three changes costing about \$13.8 million added performance capabilities to the station beyond those included in the original design. These were (1) Space Station Change Notice 850, with an estimated cost of \$0.2 million, that added new capabilities to the station's communications system; (2) Change Notice 880, at an estimated cost of \$0.1 million, that provided crew members with the ability to distribute data, procedures, and timelines to different locations on the station; and (3) Change Notice 952, at an estimated cost of \$13.5 million, that added a science data recording system to the station. The recorders are needed to prevent the loss of science data in the event of a communications failure.
- **Operability:** 56 changes costing about \$27.2 million were made to correct operability deficiencies discovered after hardware or software had been built. For example, change 2160 modified the Hatch Operations Kit because it interfered with handles and latches on a pallet used to carry cargo to the space station. This problem was discovered after the kit had been developed.
- **Design/Performance Resolution:** 105 changes costing about \$115.6 million were made to correct design deficiencies. For example, change 2000 added more worksite interfaces for replacement of temperature control devices in the U.S. laboratory. This problem was discovered during testing before the devices were produced.
- **Risk Reduction:** 116 changes costing about \$211.5 million were made to reduce cost, schedule, and technical risks. For example, change 2460 replaced three batteries on the station with different ones because the originals exhibited significantly faster aging than expected.

The three remaining categories grouped changes that did not add capability or revise initial designs but were needed for other purposes, such as updating program documentation. These categories are:

- International Partner: 21 changes costing about \$102.0 million were made to accommodate changed requirements for the International Partner portions of the space station. For example, change 2017 enabled Boeing to obtain critical parts for hardware needed by NASA's Italian partner Alenia to avoid schedule impacts. Boeing was able to obtain and deliver these parts more quickly than Alenia's subcontractors, thus avoiding costly impacts to Alenia's schedule.
- Spares Provisioning: 45 changes costing about \$408.4 million were made to procure spare parts for the station. At the time the contract was signed in January 1995, detailed requirements for space station spare parts were not yet available. Therefore, a special clause was included in the contract to allow for procurement of spare parts when the requirements were sufficiently defined. Funds for the spare parts are included in the space station budget, and the costs are added to the prime contract when NASA orders the parts from Boeing. For example, change 1089 procured spares for solar arrays and temperature control systems.
- Administrative/Configuration Management Updates: 247 changes costing about \$19.2 million were made to approve or update space station supporting documents. For example, Space Station Change Notice 2054 was made to develop and approve space station training and certification plans.

Table 1 groups the total numbers and estimated costs of each type of change.

**Table 1: Changes to International Space Station Prime Contract in Fiscal Years 1998 and 1999**  
(then-year dollars<sup>a</sup> in millions)

Type of change <sup>b</sup>	Number of changes	Estimated cost
Changes adding capability or revising initial designs		
New capability	3	\$13.8
Operability	56	27.2
Design/performance resolution	105	115.6
Risk reduction	116	211.5
Subtotal	280	\$368.1
Other changes		
International partner	21	102.0
Spares provisioning	45	408.4
Administrative/configuration management system updates	247	\$19.2
Subtotal	313	529.6
<b>Total</b>	<b>593</b>	<b>\$897.7</b>

<sup>a</sup>Then-year dollars represent the estimated actual value of the funds for a particular year.

<sup>b</sup>NASA personnel categorized the changes using their judgment to apply criteria developed jointly by NASA and us.

**Question 2: For the changes made to add capability or revise initial designs, how many were initiated before NASA and the contractor agreed on a cost and what is their total estimated cost?**

NASA can authorize work to be initiated before a final cost is negotiated with Boeing. However, the number of such changes, which NASA calls undefinitized contract actions, are to be limited in number. Current NASA policy states that "Undefinitized contract actions shall be executed by contracting officers on an exception basis and shall be limited to the minimum urgent requirements."<sup>1</sup>

For the changes made to add capability or revise initial designs, we found that NASA authorized 187 changes to the space station prime contract before a final cost was negotiated with Boeing. The estimated total cost of these contract actions is \$356.9 million. Table 2 lists the types, numbers, and estimated costs of the undefinitized contract actions for work that added capability or revised initial designs.

<sup>1</sup> NASA FAR Supplement 1843.7002—Undefinitized Contract Actions, Policy.

**Table 2: Undefined Contract Actions That Added Capability or Revised Initial Designs in Fiscal Years 1998 and 1999**  
(then-year dollars<sup>a</sup> in millions)

Types of changes <sup>b</sup>	Number of changes	Total estimated cost of changes
New capability	1	\$13.5
Risk reduction	100	207.5
Design/performance resolution	69	114.3
Operability	17	21.6
<b>Totals</b>	<b>187</b>	<b>\$356.9</b>

<sup>a</sup>Then-year dollars represent the estimated actual value of the funds for a particular year.

<sup>b</sup>NASA personnel categorized the changes using their judgment to apply criteria developed jointly by NASA and us.

Concerns about NASA's use of undefinitized contract actions have been previously expressed. In a 1994 report<sup>2</sup> on NASA procurement practices, we noted that when contract changes are uncostered, the government's cost risk increases, and the longer changes remain undefinitized, the more risk increases. Also in a 1994 report<sup>3</sup>, the NASA Office of Inspector General recommended that the Space Station Program put in place a procedure to ensure that undefinitized changes are issued on a strictly limited basis. NASA management concurred with that recommendation, citing new policies instructing that as a general rule, all contract actions were to be fully negotiated and definitized prior to issuance. In March 1997<sup>4</sup> the NASA Office of Inspector General found that the Space Station Program was issuing undefinitized contract actions for the majority of changes to the space station prime contract. The Inspector General made no recommendation because the program was following prescribed procedures for issuing undefinitized contract actions.

We found that there have been a total of 316 undefinitized contract actions to the prime contract during fiscal years 1998 and 1999. Their total estimated cost is \$879.7 million. Thus, undefinitized contract actions comprise 53 percent of all changes and 98 percent of all costs due to changes. Figure 1 compares the number and total estimated cost of definitized contract actions with those that are undefinitized.

<sup>2</sup>NASA Procurement: Challenges Remain in Implementing Improvement Reforms (GAO/NSIAD-94-179, Aug. 18, 1994).

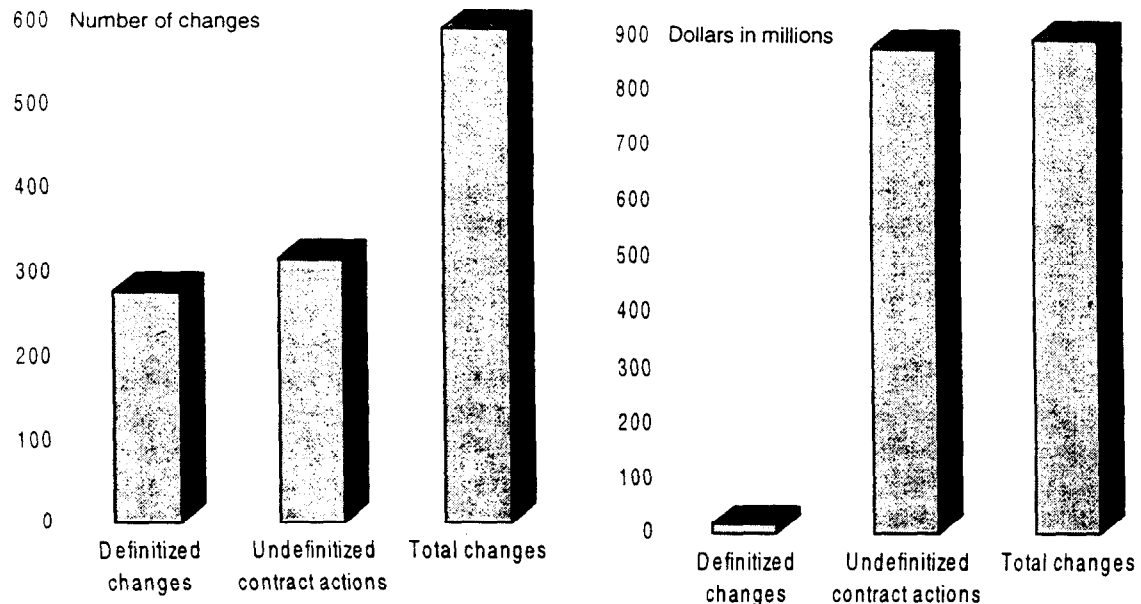
<sup>3</sup>Undefinitized Change Orders, NASA Office of Inspector General, Audit Report (HA-95-001, Nov. 9, 1994).

<sup>4</sup>Space Station Change Order Process, NASA Office of Inspector General, Audit Report (IG- 97-015, Mar. 5, 1997).



**Figure 1: Number and Total Cost of Changes Made to the Space Station Prime Contract Before and After Costs Were Negotiated in Fiscal Years 1998 and 1999**

(then-year dollars<sup>3</sup> in millions)



<sup>3</sup>Then-year dollars represent the estimated actual value of the funds for a particular year.

NASA officials told us they recognized that the use of undefinitized contract actions is not the preferred way of doing business, as stated in NASA policy, because the cost of the change is unknown while the work is being done. However, the policy allows the use of undefinitized contract actions to meet urgent technical and schedule requirements, provided such changes are properly justified and documented. Program officials explained that undefinitized contract actions are used to initiate changes immediately to (1) avoid delaying the space station program schedule, (2) change work that is in process, or (3) take advantage of in process work to reduce the cost of a change. It can take several months to process a change, including negotiating the cost, fully defining the technical scope of a change, and adding the change to the prime contract. NASA has established a goal to finalize undefinitized contract actions within 180 days, or about six months, after a change is issued.<sup>5</sup>

We found that it took between seven and 13 months to negotiate three of the five highest-cost undefinitized contract actions on the prime contract during fiscal years 1998 and 1999. Costs for three of the changes had been negotiated as of September 30, 1999, while the costs of the remaining two changes were still being negotiated. At that time, one change had been open for four months, and the other had been open for eight months.

<sup>5</sup> NASA FAR Supplement 1843.7005—Undefinitized Contract Actions, Definitization.

According to space station program records, the estimated average total monthly value of undefinitized contract actions during fiscal years 1998 and 1999 was \$452.9 million. The lowest total monthly value was \$265.9 million in December 1998, and the highest was \$673.0 million in November 1997. Data for March 1998, November 1998, and March 1999 was unavailable.

**Question 3: What was the variation in the proposed and final negotiated costs of changes for which work was initiated before NASA and the contractor agreed on a cost?**

Because the data NASA provided on proposed and negotiated costs for undefinitized contract changes contained errors that would have imposed significant demands on space station program officials' time to correct, we obtained and analyzed data on the five highest-cost changes.

NASA officials had completed negotiations for three of the five highest-cost changes and, in two cases, negotiated costs were approximately 20 percent lower than the contractor's proposals. In the third case, in which a \$220.9 million reduction to the cost of the space station contract resulted from deleting the Habitation Module, the final negotiated cost was 0.23 percent lower than the contractor's proposal. Table 3 summarizes the variation between the contractor's proposed costs and the final negotiated costs for these changes.

**Table 3: Difference Between Proposed and Negotiated Estimated Costs of Five Space Station Undefined Contract Actions in Fiscal Years 1998 and 1999**

(then-year dollars<sup>a</sup> in millions)

Actions	Proposed cost	Negotiated cost	Difference	Percent difference
Deletion of Habitation Module	-\$220.4	-\$220.9	- \$0.5	- 0.23
Payload engineering integration and payload software integration and verification	\$108.6	\$86.7	- \$21.9	- 20.2
Implementation of assembly sequence revision C	\$68.1	\$55.9	- \$12.2	- 17.9
Spare parts for photovoltaic and active thermal control systems	\$57.8	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Development of software for node 3	\$55.0	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>

<sup>a</sup>Then-year dollars represent the estimated actual value of the funds for a particular year.

<sup>b</sup> A final cost for the change had not been negotiated as of September 30, 1999.

**Question 4: Has NASA expended funds for space station enhancements that were not called for in the original contract's baseline design and are not currently included in NASA's space station program budget?**

NASA estimates that in addition to the \$24.0 billion<sup>6</sup> space station program budget it will spend \$19.4 million<sup>7</sup> for enhancements to the space station that were not included in the original design and that are not currently included in the space station program budget. While the results of these activities will provide enhancements to the space station, the activities are being implemented outside the program, according to NASA officials. NASA explained that these activities were never intended or required to be part of the space station prime contract. The highest estimated cost will be \$15.9 million to support operation of a Department of Energy science instrument on the station. The next-highest estimated cost is \$3.5 million for inflatable TransHab module studies. Table 4 shows the activities identified by NASA and their estimated costs. NASA officials explained that due to difficulties in obtaining comprehensive information from all NASA units about expenditures for space station-related goods and services that are not part of the space station

<sup>6</sup> The figure is NASA's fiscal year 1999 estimated total space station program budget.

<sup>7</sup> The figure excludes costs-to-completion for the TransHab, ACCESS, and MOXE activities because NASA has not yet approved them for full-scale development.

program budget, the information provided is an estimate. The officials noted that while they made the best possible efforts to collect information under constrained resources, some space station-related activities might have been unintentionally omitted.

**Table 4: Expenditures for Space Station Enhancements Not in the Space Station Program Budget**

(then-year dollars<sup>a</sup> in millions)

Activity <sup>b</sup>	Activity Start Dates (fiscal years)	Development Complete Dates (fiscal years)	Fiscal Year 1998 Expenditures	Fiscal Year 1999 Expenditures	Total Estimated NASA Cost
Space station alpha magnetic spectrometer mission management	1999	2007	\$0	\$1.6	\$15.9
TransHab module study	1998	2000	3.2	0.3	3.5 <sup>c</sup>
Advanced projects funding	1999	2000	2.3	0.2	
Engineering technical base funding	2000	2000	0.9	0.1	
ACCESS <sup>d</sup>	1998	TBD <sup>e</sup>	1.6	\$1.2	TBD <sup>c</sup>
MOXE <sup>f</sup>	1999	TBD <sup>e</sup>	\$0.1	TBD <sup>e</sup>	TBD <sup>c</sup>
<b>Total estimated cost</b>					<b>\$19.4</b>

<sup>a</sup>Then-year dollars represent the estimated actual value of the funds for a particular year.

<sup>b</sup>NASA personnel identified the non-space station program activities that provided enhancements to space station capabilities using their judgment to apply criteria developed by NASA and us.

<sup>c</sup>These are not cost-to-completion estimates because the TransHab, ACCESS, and MOXE activities are not approved programs and are therefore not included in NASA's budget.

<sup>d</sup>Advanced Cosmic ray Composition Experiment for Space Station is a science instrument planned for installation on the space station.

<sup>e</sup>To be determined by NASA.

<sup>f</sup>This is an X-ray science instrument planned for installation on the space station.

**COMMENTS FROM THE NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION**

National Aeronautics and  
Space Administration  
**Office of the Administrator**  
Washington, DC 20546-0001



APR 13 2000

Mr. Allen Li  
Associate Director  
Defense Acquisition Issues  
General Accounting Office  
Washington, DC 20548

Dear Mr. Li:

Thank you for the opportunity to review and comment on the recent draft report entitled, "Space Station – Prime Contract Changes (GAO/NSIAD-00-103R)". Enclosed are our comments.

Please contact Mr. Robert Soltess on 358-1895, if further assistance is required.

Sincerely,

A handwritten signature in black ink that reads "Daniel R. Mulville". The signature is fluid and cursive, with the first name "Daniel" being particularly prominent.

Daniel R. Mulville  
Associate Deputy Administrator

Enclosure

**COMMENTS FROM THE NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION**

**NASA Comments on GAO Draft Report Entitled  
"SPACE STATION - Prime Contract Changes"  
GAO/NSIAD-00-103R**

We have completed our review of the GAO draft report entitled "SPACE STATION: Prime Contract Changes," and would like to make the following general observation and specific suggestions.

See comment 1,  
page 17.

**General Comment:**

The ISS Program issues UCA's in accordance with NASA policy. Every UCA has an urgency statement that is reviewed and concurred on by ISS Program personnel. Furthermore, all UCA's over \$1million are reviewed and approved by the ISS Program Manager and the JSC Center Director. Over the past three years the number of UCA's issued by the ISS Program has been steadily declining, as well as the age of the UCA's and the number of UCA's over 180 days. In July of 1998, there were 74 UCA's, valued at \$398M with an average age of 216 days. The following year in June 1999, the program reported 41 UCA's valued at \$260M with an average age of 165 days. Currently, as of March 31, 2000, the program is carrying 37 UCA's valued at \$241M with an average age of 79 days. The use of UCA's on the ISS Program has received and continues to receive much oversight and management. However, in as much as the ISS is a complex system of both U.S. and International Partner (IP) space hardware and the ISS Program in nearing completion of DDT&E, we anticipate having many urgent changes as we continue to deliver technical content on schedule. All changes, including UCA's, will continue to receive technical and business management attention.

See comment 2,  
page 17.

**Specific Suggestions:**

Page 1 – Paragraph 1 – NASA suggests replacing the final sentence with the following language." The prime contract was valued at \$5.6 billion when it was signed in January 1995 and is currently budgeted at \$10.2 billion with a scheduled development completion date of August 2004."

See comment 3,  
page 17.

Page 2 - NASA objects to the wording in the fourth paragraph, "Due to limitations on the availability of data on proposed and negotiated costs for contract changes" the GAO had to just look at the five highest cost changes. The data the GAO requested regarding government contract change estimates, for both proposed and negotiated changes, is available data. It is not, however, consolidated into one database or place. Cost estimates for change directives are in a configuration management database. Proposed and negotiated cost data are in a contracts database. GAO requested this data be extracted and consolidated for all 593 changes issued in FY 1998 and 1999. This was an unreasonable burden that would have required a significant workload for procurement and configuration management personnel to obtain the data from both databases and then integrate the data into one spreadsheet. GAO was given access to the data. NASA would prefer the following replacement language, "Due to the number of changes in the audit population (593) and the quantity of data (cost, schedule, technical data) on each change, we chose to focus our attention to the five highest cost changes and the supporting data." This comment also applies to the same language used on Pages 3 and 9.

**COMMENTS FROM THE NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION**

See comment 4,  
page 17.

Page 3 – NASA objects to the wording in the second paragraph, "NASA identified four activities costing about \$22.9M that will provide enhancements to the space station not included in the original contract, and not included in NASA's space station budget." The activities referenced were never intended or required to be a part of the ISS prime contract and should not be included as part of the prime contract discussion.

See comment 5,  
page 17.

Page 5 – NASA objects to the wording in the third paragraph, "NASA officials categorize the 593 changes into one of seven categories that describe why the changes were made." The ISS program does not routinely categorize changes, but did develop a set of categories and sort those changes to assist the GAO in their assessment. NASA would prefer the following replacement language, "At our (GAO) request, NASA officials categorized the 593 changes into one of seven categories, using definitions of the categories jointly agreed to between GAO and NASA."

See comment 6,  
page 17.

Page 6 – The heading "IP Initiated" should read just "International Partner". The paragraph should read "Twenty-two changes costing about \$102 M were made that fell into this category. IP changes are changes driven or caused by IP hardware requirements changes or proposed/existing international agreements." GAO should delete the rest of the paragraph because the example used by GAO does not fall into this category. NASA did not categorize this particular change correctly for the GAO, and strongly recommends that another example of an IP change be used as an example. NASA suggests the following replacement sentence, "For example, change 2017, Emergency Procurement of GFE Connectors, was made because Alenia's harness manufacturing subcontractor could not get 25 critical connectors delivered in time to avoid costly impacts to their schedule. Boeing was able to procure and ship the parts faster than Alenia."

See comment 7,  
page 17.

Page 6 - To be technically accurate, NASA recommends replacing the paragraph on Spares Provisioning with the following language, "Forty-five changes costing about \$408.4M added contract value to the space station prime contract to procure spare parts for the space station. The ISS Program contemplated buying spares through the Boeing Prime contract, but, at the time the contract was signed in January 1995, the ISS spares strategy was still being finalized. NASA included a special clause, H.2 Provisioning Procedures, to allow for the ordering of spares through Provision Item Orders (PIOs) as the spares were identified. Spares are part of the ISS budget, and funds are obligated to the contract as NASA issues PIOs to Boeing."

See comment 8,  
page 17.

Page 7 – The term "IP Initiated" should be replaced with the term "IP".

See comment 9,  
page 17.

Page 8 – NASA recommends that the second paragraph be modified to read "For the time period that we audited (FY98 and FY99), there were a total of 316 of 593 changes issued to the Prime contractor as undefinitized contract actions."

See comment 10,  
page 17.

Page 9 – NASA recommends that the sentence in the middle of the page be modified to read "Program officials explained that UCA's are used to initiate changes to the contract baseline immediately for several reasons, including: 1) to change work in flow; 2) to start urgent work to avoid schedule impact; or 3) to take advantage of other work in process to achieve a cost avoidance on the change-related work. Because the process of finalizing the technical directive, obtaining a proposal, fact-finding and negotiating that proposal and changing the contract sometimes takes several months, the UCA is issued to the Prime contractor."

See comment 11,  
page 17.

Page 9 – NASA objects to the wording of the final sentence on the page. Same comment as on Pages 2 and 3.

**COMMENTS FROM THE NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION**

See comment 12,  
page 17.

Page 11 – NASA recommends replacing the words “The highest estimated cost will be \$15.9 million to operate a spectrometer science instrument on the station” with the following replacement language, “The highest cost activity will be providing mission management and support to the Department of Energy’s Alpha Magnetic Spectrometer science instrument that will fly aboard the ISS.”

See comment 13,  
page 17.

Page 12 – NASA recommends that the subbreaks under TransHab Module Study be deleted from Table 4. NASA recommends that the second sentence of footnote c be deleted.



**GAO COMMENTS**

The following are GAO's comments on NASA's letter dated April 13, 2000.

1. We recognized NASA's comments in our summary of agency comments on page 3.
2. We revised the text to reflect the points raised by NASA.
3. NASA objected to our statement that the availability of data on the proposed and negotiated costs for space station changes was limited. We revised the text to state the data contained errors and that correcting the errors would have imposed significant demands on program officials' time. To overcome the problem and provide some insight into this issue, we manually collected proposed and negotiated cost data for the five highest value undefinitized contract actions during fiscal years 1998 and 1999 from documents in NASA's space station contract files at Johnson Space Center.
4. We revised the text to reflect the points raised by NASA.
5. We revised the text to reflect the points raised by NASA.
6. We revised the text to reflect the points raised by NASA.
7. We revised the text to reflect the points raised by NASA.
8. We revised the text to reflect the points raised by NASA.
9. We revised the text to reflect the points raised by NASA.
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12. We revised the text to reflect the points raised by NASA.
13. We revised the text to reflect the points raised by NASA.

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