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REPORT TO THE CONGRESS

Overstatement Of Contract Target Cost For First Stage Of Saturn V Launch Vehicle B-161366

National Aeronautics and Space
Administration

*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*

~~713-104~~ **093394**

OCT 26, 1970



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D C 20548

B-161366

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on overstatement of contract target cost for the first stage of the Saturn V launch vehicle, National Aeronautics and Space Administration

Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67)

Copies of this report are being sent to the Director, Office of Management and Budget, and to the Administrator, National Aeronautics and Space Administration

A handwritten signature in black ink that reads "James B. Stacks".

Comptroller General
of the United States

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D I G E S T

WHY THE REVIEW WAS MADE

Preliminary reviews by the General Accounting Office (GAO) at the Marshall Space Flight Center indicated a large cost underrun of the target cost under a cost-plus-incentive-fee contract for the first stage of the Saturn V launch vehicle. Underruns of the target cost-- a cost forecast included in a contract for control purposes--result, in an incentive type of contract, in a larger fee for the contractor.

If a target cost in a contract is not based on accurate, complete, and current data, an underrun might be due to an initial overestimate of cost, rather than to efficiency of the contractor.

GAO examined into this contract between the National Aeronautics and Space Administration (NASA) and The Boeing Company to determine whether that portion of the target cost related to materials was based on the latest cost and pricing data available to Boeing at the time it certified the contract prices

GAO reviewed about 34 percent of the proposed cost of \$272 million for materials. Its review did not include an examination of either labor or overhead costs

FINDINGS AND CONCLUSIONS

The target cost included amounts for certain materials and indirect costs which were overstated by about \$2.6 million on the basis of cost and pricing data available to the contractor before he submitted the pricing certificate. As a result, the total fee Boeing could earn under the contract was increased by about \$695,000. (See p. 7)

Two among various examples of the overstated costs are.

--Boeing's proposal included the cost of 74 outboard fuel duct units, although its records showed a requirement for only 67 units. That, along with pricing errors, resulted in the target cost's being overstated by about \$351,600. (See p. 8)

--Boeing's proposal included a price of about \$5,300 for each of 25 fuel container pressurizing valves. Boeing had previously negotiated with a supplier a unit price of about \$4,100 for the valves. As a result of the use of the higher price, the target cost was overstated by about \$46,900. (See p. 9.)

RECOMMENDATIONS OR SUGGESTIONS

GAO is recommending that the NASA Administrator require that

- a postaward evaluation be made of significant material costs that were not reviewed by GAO, to determine whether the costs were based on accurate, complete, and current data. (See p. 12.)
- the evaluation include a determination as to whether labor and overhead costs may have been applicable to overstated material costs and included in the target cost, and, if so, to what extent. (See p. 12.)
- appropriate adjustment be made for the excess fee resulting from the overstated material costs reported herein and from any further overstated costs that are revealed by the postaward evaluation. (See p. 13.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

Boeing generally disagreed with GAO's findings. (See p. 17.) NASA, however, said that it would make a selective review of material costs not reviewed by GAO and would examine labor and overhead costs to determine the extent to which those costs might be applicable to overstated material costs. Following the review NASA plans to obtain appropriate price adjustment from the contractor. (See p. 13.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

This report is being submitted to the Congress in view of its continued interest in the reasonableness of prices negotiated by NASA for the space program.

CHAPTER 1

INTRODUCTION

The General Accounting Office has reviewed the target cost negotiated for cost-plus-incentive-fee contract NAS8-5608 which was awarded by the National Aeronautics and Space Administration's George C. Marshall Space Flight Center at Huntsville, Alabama, to the Launch Vehicle Branch of The Boeing Company at New Orleans, Louisiana. The scope of our review is described in Chapter 4.

A cost-plus-incentive-fee contract is a cost-reimbursement-type contract that specifies a target cost and a target fee and typically provides for increasing or decreasing the fee in accordance with the degree to which the contractor meets or exceeds a combination of predetermined cost, schedule, and performance targets.

The target cost and fee are negotiated by NASA and the contractor on the basis of their best estimates of the reasonable cost of performing the work called for by the contract. When negotiated target costs are not established on the basis of accurate, complete, and current data, cost underruns may result from the initial overestimates of costs rather than the efficiency of the contractor. In such cases the additional fee paid to a contractor above the target fee is in the nature of a windfall rather than an earned fee.

*they also
may also
result in
the
opportunity
of penalty*

In September 1962 the Congress enacted the Truth in Negotiations Act (Public Law 87-653) for the purpose of providing the Government with safeguards against inflated cost estimates by contractors in negotiated procurements where competition is lacking. The act provides that, before the award of certain negotiated contracts where the price is expected to exceed \$100,000, a prime contractor or subcontractor be required to submit cost or pricing data in support of its price proposal and to certify that, to the best of its knowledge and belief, the data submitted is accurate, complete, and current. The act also requires that these contracts contain a provision that the contract price be adjusted to exclude any significant price increases which

the head of the agency determines were caused by the furnishing of inaccurate, incomplete, or noncurrent cost or pricing data.

NASA has provided for the implementation of Public Law 87-653 in its procurement regulation. To ensure the reasonableness of a contractor's price proposal and to establish a sound basis for negotiations, NASA procurement regulation part 3.807-2 provides for an analysis of the cost or pricing data furnished. Part 3.809 provided, in January 1964, that "Audit services should be utilized as a pricing aid by the contracting officer to the fullest extent appropriate ***." In November 1967 an amendment provided for increased emphasis on the use of audit services by requiring, rather than encouraging, contracting officers to use such services for negotiated contracts in excess of \$100,000.

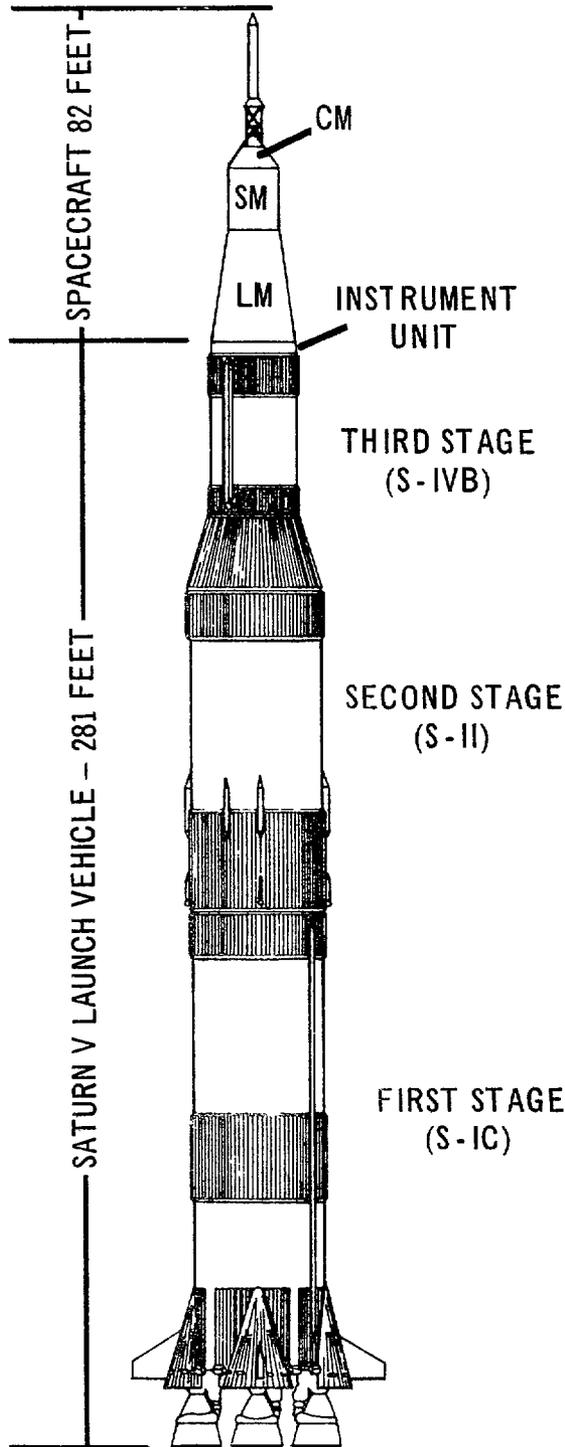
CONTRACT NAS8-5608

In January 1963 NASA awarded cost-plus-fixed-fee contract NAS8-5608 to Boeing for the production of 11 (later reduced to 10) S-IC stages which are a part of the Saturn V launch vehicles used in the manned space flight program. A picture furnished by NASA of the Saturn V launch vehicle appears on the next page. The price negotiated for this contract was about \$418.8 million, including a fee of about \$25.2 million. Included in the contract was a provision that Boeing agree to explore with the contracting officer the possibility of including an incentive provision in the contract at a later date.

In a letter to the directors of NASA field centers dated in February 1963, the NASA Associate Administrator encouraged the use of incentive provisions in their contracts as a means of reducing costs, maintaining schedules, and obtaining superior hardware.

At NASA's request, Boeing submitted a price proposal in September 1965 to convert the contract to a cost-plus-incentive-fee contract and to increase the original scope of work. In November 1965 Boeing gave NASA a certificate confirming the accuracy, completeness, and currency of the price proposal data as of November 2, 1965. The contract was modified (conversion modification) on December 7, 1965,

SATURN V LAUNCH VEHICLE



INSTRUMENT UNIT
DIAMETER _____ 21 7 FEET
HEIGHT _____ 3 FEET
WEIGHT _____ 4,306 LBS
THIRD STAGE (S-IVB)
DIAMETER _____ 21 7 FEET
HEIGHT _____ 58 3 FEET
WEIGHT _____ 260,523 LBS FUELED 25,000 LBS DRY
ENGINES _____ ONE J-2
PROPELLANTS...LIQUID OXYGEN (192,023 LBS , 20,107 GALS) LIQUID HYDROGEN (43,500 LBS , 77,680 GALS)
THRUST _____ 178,161 TO 203,779 LBS
INTERSTAGE _____ 8,081 LBS
SECOND STAGE (S-II)
DIAMETER _____ 33 FEET
HEIGHT _____ 81 5 FEET
WEIGHT _____ 1,059,171 LBS FUELED 79,918 LBS DRY
ENGINES _____ FIVE J-2
PROPELLANTS...LIQUID OXYGEN (821,022 LBS , 85,973 GALS) LIQUID HYDROGEN (158,221 LBS , 282,555 GALS)
THRUST _____ 1,120,216 TO 1,157,707 LBS
INTERSTAGE _____ 1,353 (SMALL) 8,750 (LARGE)
FIRST STAGE (S-IC) (note a)
DIAMETER _____ 33 FEET
HEIGHT _____ 138 FEET
WEIGHT _____ 5,022,674 LBS FUELED 288,750 LBS DRY
ENGINES _____ FIVE F-1
PROPELLANTS...LIQUID OXYGEN (3,307,855 LBS , 346,372 GALS) RP-1 (KEROSENE) -(1,426,069 LBS , 212,846 GALS)
THRUST _____ 7,653,854 LBS AT LIFTOFF

^a This report is concerned with the S-IC stage

to increase the estimated price to \$850.1 million, including fixed and target fees of about \$47.1 million. The estimated price included about \$418 million for costs incurred through June 30, 1965, plus a fixed fee of about \$21.7 million and a target cost of about \$385 million to complete the contract plus a target fee of about \$25.4 million.

Contract NAS8-5608 was again modified (follow-on modification) on November 29, 1966, to increase the number of S-IC stages to be produced from 10 to 15. This modification established an additional target cost of about \$120.1 million plus an additional target fee of about \$8.1 million. Boeing gave NASA the required certification as of November 21, 1966, of the accuracy, completeness, and currency of its pricing data.

The incentive provisions of the contract provide that the fee payable to the contractor be the target fee plus or minus predetermined percentages of the amounts by which allowable costs are either less or more than the negotiated target cost. The contract also provides specific limitations as to the maximum and minimum fee payable to the contractor.

As of August 1970, the contract price amounted to about \$1 billion including fixed and target fees of about \$59 million.

The principal NASA officials responsible for the activities discussed in this report are listed in appendix III.

CHAPTER 2

TARGET COST NOT BASED ON LATEST

AVAILABLE COST OR PRICING DATA

The target cost established by the conversion and follow-on modifications to the contract was overstated by about \$2.6 million on the basis of cost and pricing data available to Boeing prior to the effective dates of its certifications that the pricing data was accurate, complete, and current. As a result, the fee which Boeing could earn under the contract was increased by about \$695,000, as shown below.

<u>Description</u>	<u>Conversion modification</u>	<u>Follow-on modification</u>	<u>Total</u>
Net overstatements of target cost (note a)	<u>\$1,349,000</u>	<u>\$1,254,000</u>	<u>\$2,603,000</u>
Resulting increase in fee.			
Target fee	\$ 89,000	\$ 94,000	\$ 183,000
Incentive fee	<u>73,000</u>	<u>439,000</u>	<u>512,000</u>
Total	<u>\$ 162,000</u>	<u>\$ 533,000</u>	<u>\$ 695,000</u>

^aThe net overstatements represent the difference between the overstatements and understatements of costs we identified in our review.

PRICING PROPOSALS DID NOT INCLUDE
CERTAIN COST OR PRICING DATA AVAILABLE
PRIOR TO CERTIFICATION DATES

Boeing's proposals for the conversion and follow-on modifications were not based on certain cost and pricing data available to Boeing prior to the certification dates. As a result, the proposals included costs for (1) excessive quantities of some materials and (2) materials based on unit prices which were higher than those available to Boeing from its suppliers.

We made a detailed pricing review of 243 high-dollar-value items from the bills of material included in Boeing's proposals. Under the conversion modification, we selected 88 items with an estimated cost, including indirect costs, of about \$62 million from items representing total proposed costs of about \$231 million. Under the follow-on modification, we selected 155 items with an estimated cost, including indirect costs, of about \$30 million, from items representing total proposed costs of about \$41 million. In our examination of the above items, we compared the data in Boeing's proposal with purchase orders, supplier quotations, and production and test unit requirements in Boeing's records.

The following examples illustrate our findings. NASA's and Boeing's comments on our findings are included on pages 11 and 17, respectively.

Second-source pressure switches
overstated by \$372,000

Boeing's proposal for the conversion modification included about \$1.1 million for second-source pressure switches. Our review revealed that pricing errors in Boeing's proposal resulted in an overstatement of costs by about \$439,000 and an understatement of costs by about \$67,000. Thus, the target cost was overstated by the net amount of about \$372,000 including indirect costs.

Outboard fuel ducts
overstated by \$351,600

Boeing's proposal for the conversion modification included about \$3,461,000 for 74 outboard fuel duct units. Boeing's records, however, showed a requirement for only 67 units prior to the effective date of its pricing certificate of November 2, 1965. In addition, Boeing's proposal contained pricing errors which resulted in an overstatement of certain costs of about \$11,800 and in an understatement of other costs of about \$32,500. After giving effect to these pricing errors and the requirement for only 67 units, the target cost was overstated by about \$351,600 including indirect costs.

Liquid oxygen prevalves
overstated by \$81,800

Boeing's proposal for the conversion modification included about \$2 million for 49 liquid oxygen prevalves. Boeing's records, however, showed a requirement for only 43 prevalves prior to the effective date of its pricing certificate of November 2, 1965. The six additional units, amounting to about \$295,200 including indirect costs, were not required. Because Boeing incurred termination costs amounting to about \$213,400 under a subcontract in connection with the cancellation of five of these units, we are questioning only the net overstatement of about \$81,800.

Retrorocket motors
overstated by \$378,500

Boeing's proposal for the follow-on modification included about \$833,700 for 40 retrorocket motors based on a unit price of about \$20,800. This unit price was based on the supplier's quotation dated March 18, 1966. On April 13, 1966, however, Boeing amended a purchase order for the motors, changing the unit price to about \$13,000 to meet a prior contract requirement. On the basis of information subsequently furnished Boeing by the supplier, it appears that a unit price increase of about \$1,200 for a total unit price of \$14,200, rather than a unit price of about \$20,800, was in order and would allow for various contingencies. Boeing, however, submitted its pricing certification effective November 21, 1966, without adjusting its proposal to give effect to the most current cost information, with the result that the target cost was overstated by about \$378,500 including indirect costs.

Fuel container pressurizing
valves overstated by \$46,900

Boeing's proposal for the follow-on modification included about \$133,400 for 25 fuel container pressurizing valves, based on a unit price of about \$5,300. This unit price was based on a supplier's quotation dated July 28, 1966. On October 27, 1966, however, Boeing negotiated a unit price of \$4,100 with the supplier and subsequently issued a purchase order for 25 units at the reduced price.

Boeing submitted its certificate of current pricing on November 21, 1966, without adjusting its proposal to give effect to the reduced unit price, with the result that the target cost was overstated by about \$46,900 including indirect costs.

Fuel prevalves
overstated by \$138,000

Boeing's proposal for the follow-on modification included about \$834,000 for 50 fuel prevalves, based on a unit price of about \$16,700. This unit price was based on a supplier's quotation dated June 21, 1966. On September 8, 1966, however, Boeing negotiated a unit price of about \$14,800 with its supplier and later issued a purchase order at that price. Boeing submitted its certificate of current pricing on November 21, 1966, without adjusting its proposal to recognize the lower unit price obtained for these items. As a result, the target cost was overstated by about \$138,000 including indirect costs.

CHAPTER 3

NASA COMMENTS AND OUR

CONCLUSION AND RECOMMENDATIONS

NASA COMMENTS

NASA's comments on the matters included in our draft report were furnished to us in a letter dated October 10, 1969 (see app. II), by the Acting Associate Administrator for Organization and Management.

Although generally agreeing with our findings, NASA advised us that a valid basis did not appear to exist to support one of the adjustments GAO recommended. NASA stated that GAO was taking exception to the proposed procurement of six of 49 liquid oxygen prevalves on the basis that contractor's records indicated a requirement of only 43 units. The additional six units were considered by NASA to be insurance against the possible failure of a second source to produce satisfactory units; and, when one of the two subcontractors experienced production problems, the entire requirement of 43 units was procured from the more qualified subcontractor. NASA stated that the net amount of about \$81,800 in target cost related to the prevalves was therefore invalid for the defective price determination recommended by GAO.

We did not question the need for Boeing to order the additional six units as insurance, and we took no exception to Boeing's actual costs related to that order, which were properly chargeable to the production portion of the contract. We questioned only the amount included in Boeing's proposal that was in excess of such costs. We believe that the inclusion of the total price of the six additional units in Boeing's proposal was improper because, prior to the effective date of Boeing's pricing certificate, it had canceled an order for five units and had transferred one unit from a production requirement to a logistic spares requirement and thereby reduced its production requirements by six units.

The six units were priced at about \$295,200 including indirect costs and were included in Boeing's proposal for the conversion modification. However, Boeing incurred termination costs under the subcontract amounting to about \$213,400 in connection with the cancellation of five units, and we questioned only the net overstated amount of about \$81,800.

Boeing's comments on our draft report were furnished to us in a letter dated August 18, 1969. Because we omitted certain items from this report, which were included in our draft report and commented on by Boeing, and because Boeing's comments were rather detailed, we have not included a copy of its comments in this report. However, we have selected items representing about \$1.8 million from about \$2.1 million of overstated target cost to which Boeing took exception, and we have discussed them in appendix I.

CONCLUSION

We believe that the contract target cost was overstated because Boeing did not adjust its proposals to eliminate the cost of excessive quantities of certain materials or to recognize certain cost or pricing data that was available before the dates of its pricing certificates. As a result, the fee which Boeing could earn under the contract was increased by about \$695,000.

RECOMMENDATIONS

In view of the overstated target cost identified during our review and the significant amount of material costs not covered by our review, we recommend to the Administrator of NASA that:

1. A postaward evaluation be made of significant material costs that were not reviewed by GAO (about \$180 million), to determine whether the costs were based on accurate, complete, and current data.
2. The evaluation include a determination as to whether labor and overhead costs may have been applicable to the overstated material costs and included in the target cost, and, if so, to what extent.

3. Appropriate adjustment be made for the excess fee resulting from the overstated material costs reported herein and from any further overstated costs that are revealed by the postaward evaluation.

The Acting Associate Administrator for Organization and Management, in commenting on our draft report, stated that NASA would make a selective review of the material costs which were not included in our review and that the audit division would examine labor and overhead costs to determine the extent to which these costs might be applicable to overstated material costs. He stated also that, upon completion of the review, NASA would initiate action to obtain an appropriate price adjustment from the contractor.

For the reasons discussed on pages 11 and 12 of this report, we suggest that NASA reconsider its position on the liquid oxygen prevalves and include the item in its negotiations with Boeing.

CHAPTER 4

SCOPE OF REVIEW

Our examination was directed toward determining whether the negotiated target cost for selected materials was established on the basis of the latest cost and pricing data available to Boeing prior to the execution of its certificate of current pricing. We did not determine the extent, if any, that labor and overhead costs may have been applicable to overstated quantities and included in the proposed target cost. Our review did not include an examination of proposed labor and overhead costs or the contractor's cost estimating system.

In our examination, we reviewed Boeing's proposals, NASA's evaluation of the proposals, records of negotiation maintained by Boeing and NASA, and the cost and pricing data available to Boeing at the time of negotiations. The results of our review were discussed with NASA and Boeing officials.

APPENDIXES

CONTRACTOR COMMENTS AND OUR EVALUATION

Boeing, in commenting on our draft report, generally disagreed with our findings. We have evaluated Boeing's comments and have selected items representing about \$1.8 million of about \$2.1 million of overstated target cost to which Boeing took exception for discussion in the following paragraphs.

OUTBOARD FUEL DUCTS

Boeing's proposal for the conversion modification included 74 outboard fuel duct units, whereas its records showed a requirement for only 67 units prior to November 2, 1965, the effective date of its pricing certificate. In addition, Boeing's proposal contained other pricing deficiencies related to the fuel ducts, which resulted in an overstatement of costs of about \$11,800 and in an understatement of other costs of about \$32,500--a net overstatement of target cost of about \$351,600 including indirect costs.

Boeing stated that three of the 74 fuel ducts included in its proposal were excess but that another four units, which had been terminated, were priced at an estimate of the vendor's termination charges. Boeing also stated that the estimated vendor termination charges were a legitimate cost and were properly included in its price proposal.

Our review revealed that Boeing issued a purchase order for 28 fuel ducts on April 15, 1964, and another purchase order for 43 fuel ducts on August 27, 1965; a total of 71 fuel ducts. On September 3, 1965, or only 7 days later, four fuel ducts were canceled under the August purchase order.

During our review, we asked Boeing to provide us with documentation supporting any termination charges. Included in the bill of material was a credit for about \$98,000 which according to Boeing represented a reduction of the original estimated cost of the four units to only Boeing's termination costs. We could find no evidence of the nature or purpose of the credit, however, and Boeing provided us with documentation which revealed that the basis for the

credit amount--which was its buyer's estimate--could not be identified. We did not find anything to indicate that, in Boeing's proposal, the four units were priced at an estimate of the vendor's termination charges. Therefore, we believe that Boeing overstated its requirement by a total of seven fuel ducts with the result that the target cost was overstated by about \$351,600.

SECOND-SOURCE PRESSURE SWITCHES

Boeing's proposal for the conversion modification included about \$1.1 million for second-source pressure switches. Our review revealed that, prior to the effective date of Boeing's pricing certificate (November 2, 1965), certain cost and quantity information was available in Boeing's records which was not considered in Boeing's proposal.

In its comments, Boeing stated that it concluded negotiations with a vendor for part of this requirement 2 work-days prior to certification and that GAO was taking exception to the difference between the full requirement included in Boeing's proposal and the amount negotiated with the supplier for a portion of the requirement. Boeing stated further that, because the requirement for two additional switches was not included in the negotiations with the vendor, no overpricing existed.

The fact that Boeing did not negotiate with its supplier for the two switches had no bearing on our conclusion that Boeing had included two switches in its proposal which were not required. In our review, we compared the total requirement for the pressure switches as shown in Boeing's records with the total requirement included in Boeing's proposal. This comparison showed that Boeing's proposal included costs for two switches which were not required according to its records.

We found also that the price negotiated with its supplier for an additional quantity of pressure switches was higher than Boeing's proposal by about \$67,000. The adjustment of the overstatement for the two excess pressure switches by the \$67,000 understatement in price resulted in a net overstatement of the target cost by about \$372,000.

PARTS UNDER SUBCONTRACTS

Boeing's proposal for the conversion modification included three production parts which at the time of its proposal were under fixed-price-incentive-type and cost-reimbursement-type subcontracts. The proposal for the three parts included amounts that Boeing estimated would be the final prices, although suppliers' estimates provided to Boeing prior to the effective date of its certificate (November 2, 1965), revealed lower prices than prices estimated by Boeing. As a result the target cost was overstated by about \$91,000, including indirect costs, for the production material.

Boeing stated that its buyers' estimates showed that the final prices for the items were anticipated to be in excess of the then-current prices and that its use of such estimates was proper and consistent with industry and Government practice heretofore recognized by GAO.

Our review, as discussed above, revealed that Boeing's estimates were not the most accurate, complete, or current data available prior to the effective date of its certificate and, therefore, were not consistent with the requirements of Public Law 87-653 or industry and Government practice, including that recognized by GAO.

USE OF TWO PRICING CERTIFICATES

Boeing's proposal for the follow-on modification did not include the most current pricing information related to certain items prior to the submission of its pricing certificate on November 21, 1966.

Boeing, in commenting on our draft report, stated that the negotiations for the follow-on modification were accomplished in two phases. The first phase established the target cost and the second phase established target and incentive fees, contract terms, and conditions. Boeing stated that, at the completion of each phase, it had submitted a pricing certificate--the first dated August 5, 1966, and the second on November 21, 1966.

Boeing said that August 5, 1966, was the date agreed to for determining the accuracy, completeness, and currency of the data submitted for the negotiations which were concluded on that date. Further, Boeing indicated that NASA was aware of and understood the nature of the two phases of the negotiation and that neither NASA nor Boeing contemplated an updating of data submitted for the negotiations concluded in August 1966. Therefore, Boeing indicated that overstated costs of about \$754,000, which were based on information that became available to Boeing after the August 1966 certification but prior to the November 1966 certification, had no merit, since the adequacy of pricing had been established in August.

The record of negotiations revealed that the negotiations for the follow-on modification were initiated in July 1966 and were not completed until October 1966. It seems likely that, in view of Boeing's certification in August 1966 and the magnitude of the contract modification, many changes might have occurred in the following period of nearly 3 months. We therefore believe that the submission of the second certificate was appropriate. The November 1966 certificate stated, without qualification, that the costs presented in support of Boeing's proposal were accurate, complete, and current as of November 21, 1966. Therefore, we believe the target cost was overstated by about \$754,000.

RETROCKET MOTORS

Boeing's proposal for the follow-on modification included 40 retrorocket motors at a unit price of about \$20,800 based on a supplier's quotation dated in March 1966. These motors were to be used on S-IC stages 11 through 15.

In connection with the procurement of motors for S-IC stages 3 through 10, Boeing amended a purchase order for the motors at a unit price of about \$13,000 with the same supplier in April 1966. On the basis of information the supplier subsequently furnished to Boeing, it appears that the proposal for the additional 40 motors for stages 11 through 15 should have been based on a unit price of \$14,200 instead of \$20,800. Boeing, however, submitted its

pricing certification as of November 21, 1966, without giving effect to the most current cost information available. As a result, the target cost was overstated by about \$378,500 including indirect costs.

Boeing stated that the unit price included in its proposal was the current and complete data required to be disclosed in connection with the negotiations in light of the delivery schedule of the items, the quantities to be procured, the sources of the procurement, and the pricing support submitted by the supplier.

In our opinion, Boeing should have recognized that the supplier's unit price quotation of about \$20,800 might have been unreasonably high in light of the unit price of about \$13,000, negotiated by Boeing for a prior purchase of the same motors for S-IC stages 3 through 10.

Boeing further stated that NASA's price analyst had examined the proposed price and was aware of the procurement history of the motors. Our review of the price analyst's working papers and discussions with the price analyst and other NASA officials revealed that only the supplier's quotation of March 1966 was compared to Boeing's proposal to determine the validity of the estimated cost for the motors. We did not find any evidence that the price analyst was aware of the procurement history of the motors.



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON D C 20546

REPLY TO
ATTN OF D

OCT 10 1969

Mr. Morton E. Henig
Assistant Director, Civil Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Henig

Enclosed are the NASA comments on your draft report dated June 18, 1969, on Need for Improvement in the Administration of the Provisions of Public Law 87-653 at the Marshall Space Flight Center. As noted in the draft report, the GAO review of Cost Plus Incentive Fee Contract NAS 8-5608 awarded by the MSFC to the Boeing Company, was basically concerned with determining the extent to which the contractor complied with the provisions of P.L. 87-653, and makes no recommendation for improvement in our procurement policy and procedures.

Based upon our examination of the preaward evaluation, we believe that NASA followed the required disciplines, and at the time of negotiation, we had no reason to believe that the price was not reasonably established. However, we are cognizant of the items brought to our attention through your review in which you point out that certain current pricing data was not disclosed.

As more fully described in the enclosure, we agree with your recommendation to require a review of other material costs, and that this review include determinations of the extent that labor and overhead applicable to overstated material costs may have been included in the proposed target costs. Upon completion of this review, action to obtain appropriate adjustment of the proposed target costs will be initiated.

We appreciate your bringing this matter to our attention.

Sincerely yours,

A handwritten signature in cursive script that reads "Bernard Moritz".

Bernard Moritz
Acting Associate Administrator
for Organization and Management

Enclosure a/s

BEST DOCUMENT AVAILABLE

NASA COMMENTS ON THE DRAFT REPORT ON NEED FOR IMPROVEMENT PROVISIONS OF
PUBLIC LAW 87-653 AT MARSHALL SPACE FLIGHT CENTER (MSFC)

The General Accounting Office concluded that the target costs proposed by Boeing and used as the basis for negotiations by NASA for the conversion and the follow-on modification to Contract NAS8-5608 included certain materials and related costs which were overstated by about [See GAO note on p 27] Further, the GAO stated that the amount of fee available to Boeing exceeds by about [see p 27] the amount which would have been available if target costs for materials had been negotiated on the basis of the most accurate, complete, and current cost or pricing data, and if Boeing had advised NASA of a significant price reduction obtained after certification but before the modification was executed.

In January 1963, MSFC awarded CPFF contract NAS8-5608 for the procurement of S-IC stages. On December 7, 1965, modification 110 (MICH 110) was executed, converting contract NAS8-5608 from CPFF to CPIF with incentives on cost, schedule, and performance. Subsequently, on November 29, 1966, modification 310 (MICH 310) was executed. This modification provided for an added quantity of the S-IC stages. Based upon its review of the negotiated target costs for contract NAS8-5608, the GAO made the following findings and recommendations

FINDINGS

Higher target costs were negotiated because

1. Boeing did not update its pricing proposal to (a) eliminate unneeded material (quantities in excess of requirements) and (b) recognize lower price actually obtained from suppliers

[See GAO note on p. 27.]

RECOMMENDATIONS

In regard to the first finding, the GAO recommended that

1. The NASA Administrator require a postaward evaluation of other significant material costs proposed by Boeing for these two modifications to determine the extent to which the costs estimated were based on the most current, accurate, and complete data available
2. NASA initiate action to obtain appropriate adjustments for the overstated material costs reported by the GAO and any further overstated cost identified by the postaward evaluation recommended above.

The GAO made no recommendation relative to the second finding, stating that subsequent revisions to the NASA Procurement Regulation, if properly implemented, should appreciably improve NASA's contract administration, including the implementation of Public Law 87-653

The following comments pertain to the recommendations made and the actions that NASA will take

RECOMMENDATION 1 - that NASA make a postaward evaluation of other material costs included in the Boeing pricing proposal

NASA will make a selective review of the other material costs. In addition, the NASA Audit Division will examine labor and overhead to determine the extent to which these costs might be applicable to overstated material costs

RECOMMENDATION 2 - that NASA initiate action to obtain appropriate adjustments for overstated material costs

NASA has initiated such actions, although a final position has not been developed. We have begun discussions with the contractor concerning the GAO's specific findings in the draft report. We agree with many of the items questioned by the GAO. However, for the reasons explained below, it appears that a valid basis does not exist to support certain adjustments recommended by the GAO. The net effect of eliminating these items and the uncertainty of projecting the results of NASA's extended review preclude a firm statement as to the precise amount which NASA will seek as contract adjustments to the target cost and related incentive fees

The following tabulation sets forth a summary of the amounts questioned by the GAO and the amounts of those items which NASA believes cannot be sustained

[See GAO note on p 27.]

BEST DOCUMENT AVAILABLE

[See GAO note on p. 27.)

Item 8, LOX Prevalve. The Boeing Company proposed a quantity of 49 LOX prevalves, 43 from a qualified supplier and six from a second source. (The prevalve is one of the most critical parts on the S-IC stage) Part card records maintained by the contractor indicated a requirement for 43 units only and the GAO relied on the part card. The GAO treats the units ordered from the second source as an excess quantity. Rather than excess, the six should be counted as insurance against the failure of the second source to produce satisfactory prevalves.

The design of this critical valve required an advancement in the state of the art. NASA decided to procure an initial quantity of 12 valves from two sources (six from each) and to subsequently evaluate the progress of each. The evaluation disclosed that one of the contractors was experiencing such design problems that it was unlikely to be able to produce a satisfactory item and that the second source's progress justified a high degree of confidence that it could do the job. Therefore, Boeing recommended and NASA accepted the proposition that prudence dictated procuring the entire requirement from the more qualified source. The net amount of \$81,769 related by the GAO to the six LOX prevalues therefore is deemed invalid for any defective pricing determination as recommended by the GAO.

[See GAO note on p. 27.]

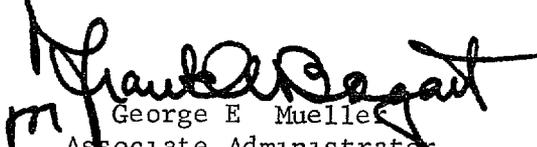
PRICING The GAO has categorized \$446,427 of the total of \$2,224,822 as overpricing due to Boeing's failure to update its proposals to give effect to later purchase order prices for Schedule 1 requirements. The \$446,427 is made up of the following items:

<u>ITEM*</u>	<u>NOMENCLATURE</u>	<u>AMOUNT</u>
48	Bellows	\$ 19,601
66	Motor	387,491
82	Pressurization Unit	28,597
85	Accelerometer	4,906
92	Bellows assembly	<u>5,832</u>
		\$446,427

*These items are keyed to the same numbers and items in the work summary sheets made available to NASA by the GAO.

FAILURE TO UPDATE. These five items were requirements against Schedule 1A, which was the follow-on quantity procured under MICH 310. The company used firm quotations solicited during March - May 1966 against these requirements in estimating the cost of the follow-on material. The company's proposal was dated April 29, 1966, and it was revised, for the last time, on August 3, 1966. Negotiations were completed on October 25, 1966, and the certificate of current cost or pricing data was executed on November 21, 1966. Purchase orders for certain requirements of Schedule 1, the original contract quantity, were being negotiated and executed during the period in which the MICH 310 proposal was being analyzed and negotiated. The GAO alleges that these five items (48, 66, 82, 85, and 92) were overpriced because the company used the firm quotations covering the items to be purchased for the Schedule 1A (MICH 310) requirement instead of using the lower purchase order prices negotiated at that time for the balance of the Schedule 1 requirement. The GAO concluded that Boeing certified that the data submitted was complete even though it should have adjusted its estimates to the lower purchase order prices negotiated under Schedule 1.

However, the contractor did reveal the basis upon which he had estimated the future costs, and we were generally aware of lower prices having been negotiated under Schedule 1. We thought the purchase orders for the Schedule 1A requirements probably would be higher than those on Schedule 1, because of differences in period of performance, quantities, and supplies and because of the upward trends in material and labor costs. However, we are cognizant of the specific items pointed out by the GAO which, in certain instances, indicated that the actual subcontract prices were negotiated at amounts less than those proposed for the pricing of Schedule 1. Accordingly, we intend to give consideration to these items in our final determinations.


George E. Muelles
Associate Administrator
for Manned Space Flight

GAO note Refers to information contained in draft report but deleted or revised in final report

PRINCIPAL OFFICIALS OF THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESPONSIBLE FOR THE ACTIVITIES
DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
<u>HEADQUARTERS</u>		
ADMINISTRATOR:		
George M. Low (acting)	Sept. 1970	Present
Thomas O. Paine	Oct. 1968	Sept. 1970
James E. Webb	Feb. 1961	Oct. 1968
DEPUTY ADMINISTRATOR:		
George M. Low	Dec. 1969	Present
Thomas O. Paine	Mar. 1968	Oct. 1968
Robert C. Seamans, Jr.	Dec. 1965	Jan. 1968
Hugh L. Dryden	Oct. 1958	Dec. 1965
ASSOCIATE ADMINISTRATOR:		
Homer E. Newell	Oct. 1967	Present
Robert C. Seamans, Jr.	Sept. 1960	Sept. 1967
ASSOCIATE ADMINISTRATOR FOR MANNED SPACE FLIGHT:		
Dale D. Myers	Jan. 1970	Present
Charles W. Mathews (acting)	Dec. 1969	Jan. 1970
George E. Mueller	Sept. 1963	Dec. 1969
ASSOCIATE ADMINISTRATOR FOR ORGANIZATION AND MANAGEMENT (note a):		
Richard C. McCurdy	Oct. 1970	Present
Bernard Moritz (acting)	May 1969	Oct. 1970
Harold B. Finger	Mar. 1967	May 1969
ASSISTANT ADMINISTRATOR FOR INDUSTRY AFFAIRS (note b):		
Daniel J. Harnett	Oct. 1969	Present
George J. Vecchietti (acting)	May 1969	Sept. 1969
Philip N. Whittaker	Aug. 1968	May 1969
Bernhardt L. Dorman	Jan. 1967	July 1968
William Rieke	June 1965	Dec. 1966
George Friedl, Jr.	June 1964	June 1965

PRINCIPAL OFFICIALS OF THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESPONSIBLE FOR THE ACTIVITIES
DISCUSSED IN THIS REPORT (continued)

<u>Tenure of office</u>	
<u>From</u>	<u>To</u>

MARSHALL SPACE FLIGHT CENTER

DIRECTOR:

Eberhard F. M. Rees	Mar. 1970	Present
Wernher von Braun	July 1960	Mar. 1970

MICHOUD ASSEMBLY FACILITY

MANAGER:

James L. Stamy (acting)	Aug. 1969	Present
George N. Constan	Sept. 1961	Aug. 1969

^aPosition established in March 1967.

^bIn January 1966 the title of this position changed from Deputy Associate Administrator of Industry Affairs to Assistant Administrator, Office of Industry Affairs.