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BY THE U.S. GENERAL ACCOUNTING OFFICE  
**Report To**  
**The Secretary Of Defense**

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**Air Force C-130 Contract Price Is Overstated  
And Proper Action Has Not Been Taken  
To Improve Lockheed's Cost Accounting  
And Estimating Systems**

The price of a contract the Air Force awarded to Lockheed for C-130 airplanes is overstated by about \$4.2 million.

Also, Air Force personnel have not adequately responded to contract audit reports of weaknesses in Lockheed's accounting and estimating systems.



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PSAD-80-69  
SEPTEMBER 4, 1980



UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

PROCUREMENT AND SYSTEMS  
ACQUISITION DIVISION

B-198948

The Honorable Harold Brown  
The Secretary of Defense

Attention: Assistant for Audit Reports  
Room 3A336  
ASD (Comptroller)

Dear Mr. Secretary:

We reviewed the pricing of Air Force contract F33657-78-C-0306, which was awarded to the Lockheed Georgia Company, Marietta, Georgia, on June 26, 1978. This contract for eight C-130 Hercules airplanes and technical data for the Air National Guard (ANG) was negotiated at a firm-fixed price of \$49.4 million.

In summary, we found that the contract price was overstated by about \$4,227,186, in part, because cost or pricing data used by Lockheed to support proposed costs for production material was not current, complete, or accurate, and, in part, because the most representative experience available did not support proposed costs for production labor and development labor. Also, the Air Force Plant Representatives Office (AFPRO) had not adequately responded to the Defense Contract Audit Agency's (DCAA's) reports of weaknesses in Lockheed's accounting and estimating systems.

Our review was made at the Aeronautical Systems Division (ASD), Wright-Patterson Air Force Base, Ohio, and Lockheed. We also considered audit work done by DCAA and the cost and price analysis done by AFPRO.

This contract was selected as part of a nationwide review of the pricing of noncompetitive prime contracts awarded by the Department of Defense. Our objectives were to determine (1) if laws, regulations, and procedures were followed in negotiating the contract price and (2) whether the contract price is reasonable in relation to cost or pricing data

B-198948

available to the contractor at the time of contract negotiations, as required by Public Law 87-653. The results of our review are provided in appendix I.

LOCKHEED COMMENTS

Lockheed's comments are included as appendix II. Lockheed does not agree with our findings and conclusions and believes that (1) the contract price was based on full disclosure and current, complete, and accurate cost or pricing data and (2) its cost accounting and estimating systems are adequate for pricing C-130 contracts. Overall, their comments are inaccurate and not relevant to the issues raised in our report. However, where accurate and relevant, their comments were considered, and appropriate revisions were made.

ASD COMMENTS

ASD officials agreed--subject to further verification of the accuracy of our report--that the contract price may have been increased because Lockheed failed to base proposed costs for material on current, complete, and accurate cost or pricing data. They also said that appropriate actions will be taken to verify any overpricing and adjust the contract price where warranted.

ASD officials said they did not rely on Lockheed's proposal and supporting cost or pricing data for development labor. Instead, they relied on AFPRO's evaluation and recommendation, which was part of the Government's prenegotiation contract price objective and initial counteroffer during negotiations. Because the contracting officer did not rely on the contractor's cost of pricing data to support proposed labor cost, the Government may have no basis for recovery.

AFPRO COMMENTS

AFPRO officials said they, including DCAA, were starting a detailed review of Lockheed's cost accounting and estimating systems. They also said that appropriate actions will be taken to correct any problems identified.

RECOMMENDATIONS

We recommend that you direct that the contracting officer consider the information presented herein and take

appropriate action to reduce the contract price. We also recommend that you emphasize to the contracting officer the importance of obtaining, reviewing, and using cost and pricing data in negotiating noncompetitive contract prices.

Because of actions promised by AFPRO, we are not making recommendations with respect to Lockheed's cost accounting and estimating systems. We do recommend, however, that you determine that AFPRO's actions are adequate to protect the Government's interest in negotiating future contracts with Lockheed. We would also appreciate being advised of any actions taken to correct weaknesses in Lockheed's cost accounting and estimating systems.

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We are sending copies of this letter to the President of the Lockheed Georgia Company; the Director, Office of Management and Budget; the Secretary of the Air Force; the Commander, ASD, Wright-Patterson Air Force Base; the Commander, Air Force Contract Management Division, Kirtland Air Force Base; and the Director, DCAA. We are also sending copies to the chairmen of the Senate Committees on Appropriations, Armed Services, and Governmental Affairs and the House Committees on Appropriations, Armed Services, and Government Operations.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We would appreciate receiving your comments on these matters and would be happy to discuss any questions that you may have.

Sincerely yours,



W. H. Sholey, Jr.  
Acting Director



REVIEW OF THE PRICE NEGOTIATEDFOR AIR FORCE CONTRACT F33657-78-C-0306WITH THE LOCKHEED GEORGIA COMPANYBACKGROUND

Contract F33657-78-C-0306 was awarded to Lockheed on June 26, 1978. The firm-fixed price of \$49.4 million was negotiated for eight C-130 Hercules airplanes and related technical data for use by ANG. The contract was based on Lockheed's proposal of about \$55.4 million, which was dated May 8, 1978. Contract negotiations were completed on June 15, 1978.

CONTRACT PRICE OVERSTATED BECAUSE OF  
NONCURRENT, INCOMPLETE, AND INACCURATE  
COST OR PRICING DATA

The negotiated contract price was overstated by about \$4,227,186 because proposed costs for production material were not based on current, complete, and accurate cost or pricing data and because the most representative experience available did not support proposed costs for production labor and development labor.

Production labor	\$2,949,699
Production material	697,550
Development labor	77,144
Profit	<u>502,793</u>
Total	<u>\$4,227,186</u>

Public Law 87-653, in essence, provides that contractors be required to submit cost or pricing data supporting cost proposals for negotiated procurements expected to exceed \$100,000 and to certify that the data is current, complete, and accurate. Contract prices, including profits, may be adjusted to exclude any significant increases attributable to noncurrent, incomplete, or inaccurate cost or pricing data.

A cost analysis is also required when cost and pricing data is required to be submitted. Cost analysis is a review of the contractor's data and judgments applied in projecting from the data the estimated cost to reach an opinion on whether the price proposed is fair and reasonable.

Lockheed certified that cost or pricing data submitted to the contracting officer or his representative was current, complete, and accurate as of June 15, 1978, the date of price agreement.

Production labor

Proposed labor costs were overstated by as much as \$2,949,699 because the most representative experience available supported, significantly, lower manufacturing labor costs.

Manufacturing labor	\$2,242,175
Quality assurance labor	245,207
General and administrative expenses	<u>462,317</u>
Total	<u>\$2,949,699</u>

Manufacturing labor

Lockheed proposed 567,376 manufacturing labor hours (70,922 per airplane) at \$23.58 per hour 1/ for common, peculiar, and miscellaneous production of the eight ANG airplanes. These requirements were developed primarily from recorded and estimated experience with three airplanes produced for Ecuador, Egypt, and the Philippines.

We believe that experience with 53 airplanes produced for the U.S. Air Force (USAF) was the most current, complete, and accurate cost or pricing data available to Lockheed. That experience shows a requirement of from 448,896 to 472,288 manufacturing labor hours (56,112 to 59,036 per airplane) for producing the ANG airplanes. This is from 95,088 to 118,480 hours and \$2,242,175 to \$2,793,758 less than proposed by Lockheed.

Lockheed disagreed because the USAF airplanes were produced in lots 42 through 47. (See app. II, p. 20.) Although this statement is true, it is not relevant as explained below.

Forty-eight of the USAF airplanes were produced under contract F33657-74-C-0226 and 5 were produced under contract F33657-75-C-0386. Nine of the last 13 USAF airplanes were produced in production lot 47, the same lot in which the Philippine and Egyptian airplanes were produced. The last 4 USAF airplanes were produced in lot 48, after the Philippine and Egyptian airplanes and just before the Ecuadorian airplane, which was produced in lot 49. Lockheed contends that experience with the Ecuadorian airplane was more current,

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1/As used in this report, hourly rate includes direct cost and overhead costs.

consistent with its estimating methods, and valid based on lot 53 cost experience. While we agree that the Ecuadorian airplane was delivered a few months after the USAF airplanes, we believe that the data from the USAF airplanes was more relevant as explained below. Also, while cost experience from lot 53 would tend to support the validity of the production labor estimate, it has no bearing on pricing the contract since it was not available until several months after the contract price was negotiated.

The 53 USAF airplanes were delivered from March 31, 1975, through May 27, 1977. However, the last 13 were delivered after September 23, 1976, and 8 were delivered after November 24, 1976. In comparison, the Philippine airplane was delivered on November 24, 1976, the Egyptian airplane on December 8, 1976, and the Ecuadorian airplane on July 12, 1977.

The ANG and USAF airplanes were comparable with respect to most significant configuration features and systems. The Philippine, Egyptian, and Ecuadorian airplanes were not comparable to the ANG airplanes, particularly with respect to peculiar configuration features which have a significant impact on manufacturing labor requirements.

The Philippine and Ecuadorian airplanes were basically standard configuration airplanes and not comparable to the ANG airplanes with respect to overall production requirements. To compare the ANG, USAF, and Egyptian airplanes, which were all equipped with peculiar configuration requirements, we selected 47 configuration features. A Lockheed official said that our selection represented significant requirements of the airplanes being compared.

The ANG and USAF airplanes matched in 33, or 70 percent, of the 47 comparisons. Eleven of the 14 differences represented changes in standard configuration requirements or retention of standard requirements for the ANG airplanes. In contrast, the ANG and Egyptian airplanes matched in only 19, or 40 percent, of the comparisons. Only 5 of the 28 differences related to standard configuration requirements.

Peculiar configuration features have a significant impact on manufacturing labor requirements. The ANG and USAF airplanes were also much more comparable in this respect. For example, the 47 configuration features reviewed included 25 peculiar requirements for the ANG airplanes, 26 for the USAF airplanes, and only 5 for the Egyptian airplanes. Moreover, the peculiar requirements of the ANG and USAF airplanes matched in 21 cases. Requirements of the ANG and Egyptian airplanes matched in only two cases.



Also, Lockheed estimated that peculiar configuration features of the ANG airplanes weighed about 1,538 pounds compared to 2,448 pounds for the first 48 USAF airplanes and 1,042 pounds for the last 5 USAF airplanes. (Differences between the USAF and ANG airplanes are attributable to the standardization of several configuration features.) In contrast, peculiar requirements of the Egyptian airplane weighed only 572 pounds.

The information on production time frames and configuration features demonstrates, in our opinion, that production experience with the 53 USAF airplanes was the most current, complete, and accurate information available to Lockheed for estimating manufacturing labor requirements for the ANG airplanes.

Including peculiar configuration work, an average of 59,036 manufacturing labor hours was charged to the first 48 USAF airplanes and an average of 56,112 hours was charged to the last 5 USAF airplanes. The decrease in labor requirements between the first 48 and the last 5 airplanes is probably due to learning and the decrease caused by standardizing several peculiar configuration features. (See app. II, p. 20.)

In comparison, Lockheed proposed an average of 70,922 manufacturing labor hours, including peculiar configuration work, for the 8 ANG airplanes. This is 11,886 hours more than charged to the first 48 USAF airplanes and 14,810 hours more than charged to the last 5 USAF airplanes. As shown by the following table, differences in proposed hours for the ANG airplanes and recorded hours for the USAF airplanes relate primarily to fabrication and assembly operations.

	Manufacturing labor hours			
	<u>Fabrication</u>	<u>Assembly</u>	<u>Flight</u>	<u>Total</u>
Proposed for ANG	37,919	30,255	2,748	70,922
First 48 USAF airplanes	<u>29,697</u>	<u>26,024</u>	<u>3,315</u>	<u>59,036</u>
Difference	<u>8,222</u>	<u>4,231</u>	<u>-567</u>	<u>11,886</u>
Proposed for ANG	37,919	30,255	2,748	70,922
Last 5 USAF airplanes	<u>27,302</u>	<u>25,690</u>	<u>3,120</u>	<u>56,112</u>
Difference	<u>10,617</u>	<u>4,565</u>	<u>-372</u>	<u>14,810</u>

Lockheed contends that calculation of a theoretical first unit for the last five USAF airplanes would yield a rate of labor-hours-per-pound-of-weight comparable to the rate used in the ANG proposal for estimating peculiar labor requirements.

(See app. II, p. 21.) We do not consider this comment relevant because we have not suggested that Lockheed should have used a labor-hours-per-pound-of-weight rate based on the USAF airplanes.

Information made available for our review did not provide evidence justifying the significant differences between proposed hours for the ANG airplanes and recorded hours for the USAF airplanes. As indicated above, the ANG and USAF airplanes had very similar configurations; and changes affecting labor hour requirements weighed about 2,448 pounds for the first 48 USAF airplanes, about 1,538 pounds for the ANG airplanes, and about 1,042 pounds for the last 5 USAF airplanes. These conditions suggest that manufacturing labor requirements for the ANG airplanes would fall between recorded hours for the USAF airplanes, which converts to a total requirement ranging from 448,896 to 472,288 hours (56,112 to 59,036 hours per airplane). This is from 95,088 to 118,480 hours (11,886 to 14,810 hours per airplane) and from \$2,242,175 to \$2,793,758 less than proposed by Lockheed.

The estimated overstatement in manufacturing labor requirements and costs may be inflated to the extent that manufacturing efficiency might be decreased by a

- loss of learning between delivery of the last USAF airplane in May 1977 and the contract date for the ANG airplanes in June 1978 and

- decrease in the production rate for C-130 airplanes, which ranged from 18 to 30 airplanes in production lots for the USAF airplanes compared to 15 airplanes in the production lot for the ANG airplanes.

We could not assess the impact of these conditions from information provided by Lockheed's cost accounting system. We believe, however, that the impact would be negligible in view of Lockheed's production of over 1,500 C-130 airplanes since 1952.

#### Quality assurance labor

Labor requirements for production quality assurance were proposed at 10.5 percent of proposed manufacturing labor hours. Proposed costs were based on a rate of \$24.56 per hour.

The overstatement of 95,088 to 118,480 manufacturing labor hours for basic lot production therefore caused an overstatement of 9,984 to 12,440 hours in proposed labor

requirements for production quality assurance. Proposed costs were overstated by \$245,207 to \$305,526.

General and administrative expenses

General and administrative expenses were proposed at \$4.40 per direct labor hour. The combined overstatement of 105,072 to 130,920 hours in proposed manufacturing and quality assurance labor hours therefore overstated proposed general and administrative expenses by \$462,317 to \$576,048.

Lockheed stated that there was no overstatement of manufacturing labor hours; hence, there was no overstatement of quality assurance, and general and administrative expenses. We disagree that there was no overstatement of manufacturing labor hours. Consequently, estimates for factors such as quality assurance labor and general and administrative expenses that are directly derived from manufacturing labor hours estimates would also be overstated.

Production material

Proposed costs for production material were overstated by \$697,550 because Lockheed failed to update its proposal for specification changes and used noncurrent vendor quotes for three items.

Failed to update proposal	\$642,299
Noncurrent vendor quotes	53,859
Excess usage (scrap, rework, etc.)	<u>1,392</u>
Total	<u>\$697,550</u>

Failure to update proposal

Lockheed's proposal was based on material requirements of model specification ER/S-7850M, dated February 14, 1978. During contract negotiations on June 7, 1978, some items were added to and deleted from requirements, and other items were changed from Lockheed to Government-furnished equipment. The contracting officer did not request an updated proposal because of Lockheed's assurances that contract costs would not be significantly affected by the changes.

As shown in the following table, however, cost decreases exceeded increases by \$642,299.

Changes in Contract Cost

<u>Part no.</u>	<u>Part</u>	<u>Cost</u>
	<u>Decrease</u>	
2CM353ClH	Generator	\$231,200
622-0507-001	Receiver-transmitter	189,435
705907-801	Receiver-transmitter	112,000
3S2060DR113A1	Regulator	85,600
622-1396-002	Transceiver	52,365
706075-802	Control	35,840
622-1678-001	Adapter	30,236
522-2447-252	Control	15,948
622-2360-001	Control	11,004
622-1680-003	Mount	7,360
A3048000-003	Mount	5,200
792-6437-001	Mount	<u>3,700</u>
Total decrease in costs		<u>779,888</u>
	<u>Increase</u>	
28B58-9A	Generator	114,182
20B95-4A	Regulator	21,215
739573	Mount	<u>2,192</u>
Total increase in costs		<u>137,589</u>
Net decrease in costs		<u>\$642,299</u>

Lockheed contends that several factors, including time constraints, costs associated with a revised specification, and both parties' knowledge of the same information, were not considered in our report. Data made available by the the contracting officer and Lockheed does not support Lockheed's position.

Noncurrent vendor quotes

Lockheed used noncurrent vendors quotes on three parts. It proposed \$680,000 for eight station keeping equipment systems, (part number AN/APN-169) based on a vendor quote dated March 7, 1978. The vendor quoted a not-to-exceed price of \$672,608 on May 1, 1978. The more current quote was \$7,392 less than proposed by Lockheed.

Lockheed also proposed \$95,760 for 40 control panels, (part number 3S60D102D1) based on a vendor quote dated March 17, 1978. The vendor quoted a price of \$73,376

on May 9, 1978. The more current quote was \$22,384 less than that proposed by Lockheed.

Finally, Lockheed proposed \$225,008 for 16 fuel tanks (part number 100001-200) based on a vendor quote dated March 16, 1978. The vendor quoted a price of \$200,925 on April 25, 1978. The more current quote was \$24,083 less than proposed by Lockheed.

Lockheed contends that the contracting officer was made aware of these later quotes at negotiations. (See app. II, p. 15.) Data made available by Lockheed and the contracting officer does not support Lockheed's position.

#### Excess usage

Proposed costs for production material included excess usage costs of 0.2 percent of proposed costs for high-value equipment and major purchased parts. This represented Lockheed's estimate of costs for scrapped, reworked, and discrepant parts. Excess usage associated with the overstatement of \$696,158 in proposed material costs was \$1,392.

#### Development labor

Proposed costs for developing the hydraulic and electrical systems of the ANG airplanes were overstated by \$77,144 because more current experience supported lower costs.

Manufacturing labor	\$58,643
Quality assurance labor	6,410
General and administrative expenses	<u>12,091</u>
Total	<u>\$77,144</u>

#### Manufacturing labor

Lockheed proposed 25,076 manufacturing labor hours at \$23.58 per hour for developing the hydraulic and electrical systems for the ANG airplanes. The labor requirements were based on a rate of 20.47 labor-hours-per-pound for the 1,225 pounds of weight associated with differences (peculiar requirements) between the hydraulic and electrical systems of the ANG airplane and a standard C-130 airplane.

Information available to Lockheed supported a rate of 18.44 labor-hours-per-pound or a requirement of 22,589

manufacturing labor hours, which is 2.487 hours and \$58,643 less than proposed.

The proposed rate of 20.47 labor-hours-per-pound was an estimate of requirements for airplanes being produced for Australia. Peculiar requirements of the hydraulic and electrical systems for the Australian airplanes weighed 855 pounds, and Lockheed estimated that development would require 17,500 labor hours (17,500 labor hours ÷ 855 pounds = 20.47 labor-hours-per-pound).

Labor requirements for the Australian airplanes consisted of the actual hours used as of April 14, 1978, and an estimate of the additional hours needed through July 6, 1978, the scheduled delivery date for the first airplane.

Actual hours used, April 14, 1978	14,783
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Projected hours needed:

April 1978	1,786	
May 1978	420	
June 1978	380	
July 1978	<u>131</u>	<u>2,717</u>
Total		<u><u>17,500</u></u>

On June 9, 1978, however, Lockheed had used only 15,372 labor hours, approximately 1,738 hours less than projected for that date and 2,128 hours less than the projected total requirement of 17,500 hours. Information available to Lockheed did not support a remaining requirement of 2,128 hours before delivery of the first airplane in about 4 weeks.

For example, information furnished by Lockheed shows that development activities with the Australian airplanes peaked in February 1978 at about 726 hours a week and that most of the planned development work was to be completed in early May 1978. Projected labor requirements for most of May, June, and July were primarily a contingency for unplanned work. These conditions are evidenced by activities which averaged about 479 hours a week in March, 204 hours a week in April, 45 hours a week in May, and 60 hours during the first full week in June.

We believe that the above information, particularly the trend indicated by the activity in May and June, indicates that Lockheed should have

--decreased projected labor requirements for the Australian airplanes by at least the overprojection of 1,738 hours as of June 9, 1978, from 17,500 hours to 15,762 hours and

--revised its proposal for the ANG airplanes to show a rate of 18.44 labor-hours-per-pound (15,762 hours ÷ 855 pounds = 18.44 labor-hours-per-pound) for development.

These actions would have decreased proposed labor hours by about 2,487 hours, from 25,076 to 22,589 hours. Proposed costs would have decreased by about \$58,643.

Lockheed stated that our estimate of hours to complete the systems development effort does not include all labor hours required because it does not include the development effort that extends beyond the delivery of the first aircraft. Also, Lockheed contends that during negotiations it made a substantial reduction in this area which reduced the total hours below our estimate of 22,589 hours. (See app. II, p. 16.)

As we stated above, Lockheed estimated the labor hour requirement based on actual experience on the Australian airplanes through April 14, 1978, and an estimate of additional hours needed to complete in July 6, 1978. Using Lockheed's own method, we computed the labor requirement substituting the most current (June 6, 1978) data available to Lockheed. Information made available to us did not indicate that the planned development effort would extend beyond delivery of the first airplane. Also, there was no indication from the information that Lockheed decreased proposed development labor requirements during negotiations.

#### Quality assurance labor

Labor for production quality assurance was proposed at 10.5 percent of proposed manufacturing labor hours. Proposed costs were based on a rate of \$24.56 per hour.

Therefore, the overstatement of 2,487 manufacturing labor hours for development overstated labor for production quality assurance by 261 hours and \$6,410.

#### General and administrative expenses

General and administrative expenses were based on a rate of \$4.40 per direct labor hour. Therefore, the overstatement of 2,748 hours in proposed manufacturing and quality assurance

labor overstated proposed general and administrative expenses by \$12,091.

#### Profit

The overstatement of \$3,724,393 in proposed costs for production labor, production material, and development labor overstated profit by \$502,793 (based on the profit rate of 13.5 percent, which was considered negotiated in the contract price). (See app. II, p. 16.)

#### AFPRO HAS NOT TAKEN ADEQUATE ACTIONS TO IMPROVE LOCKHEED ACCOUNTING AND ESTIMATING SYSTEMS

AFPRO's responsibilities include (1) surveillance of Lockheed's systems (accounting and estimating) and procedures and (2) evaluations of Lockheed's proposals for pending Government contracts. We noted several instances in which AFPRO did not adequately respond to DCAA's reports of weaknesses in Lockheed's accounting and estimating systems.

DCAA reported to AFPRO in July 1978 that Lockheed's cost accounting procedures (1) do not provide information sufficient for estimating costs for pending contracts and (2) effectively prevent the submission of current cost or pricing data as required by Public Law 87-653. The problem was reported again in December 1978.

DCAA also reported to AFPRO in January, March, and July 1979 that Lockheed had not provided information supporting the use of hours-per-pound-of-weight rates for estimating manufacturing labor requirements. DCAA concluded that the estimating technique was questionable because of differences in the configurations of airplanes produced.

Our review tends to confirm DCAA's position that Lockheed's accounting and estimating systems do not provide adequate assurance that contract prices negotiated with Lockheed are fair and reasonable.

AFPRO officials said that they presently have DCAA's findings under consideration and that they, along with DCAA, are starting a detailed review of Lockheed's cost accounting and estimating systems. The officials said that appropriate actions will be taken to correct any problems identified.



## LOCKHEED-GEORGIA COMPANY

A DIVISION OF LOCKHEED CORPORATION

MARIETTA, GEORGIA 30063

LGD/757581

20 March 1980

TO: United States General Accounting Office  
Regional Office  
221 Courtland Street, N. E.  
Atlanta, Georgia 30303

Attn: Mr. Solon P. Darnell

SUBJECT: GAO Audit of Contract F33657-78-C-0306

REF: GAO letter to Lockheed-Georgia Company, dated 21 December  
1979, Subj: GAO Draft Report of Subject Audit (LGD/757591)

1. I appreciate the opportunity provided by the GAO to review and comment on those portions of the draft report made available regarding the audit of Contract F33657-78-C-0306.

2. Initially, I believe it is appropriate to note that the GAO spent approximately 12 months auditing the subject contract. At the exit conference on 17 January 1980 you were advised that Lockheed did not agree with your conclusions because they are unsupported and in some instances reflect a lack of understanding of the nature of the contract negotiations and Lockheed's cost accounting and estimating system and practices. Consequently, it has been necessary for Lockheed to prepare, in a relatively short time, a response, which is attached hereto. This response deals with the highlights of your Report and Lockheed may choose to supplement it at a later date.

3. Briefly, Lockheed's position is that there is no basis for any defective pricing allegation as asserted by the GAO. Furthermore, that Lockheed's cost accounting and estimating system and practices are in accord with applicable regulatory and statutory requirements. To the extent feasible, we have attempted to explain this position in the Attachment.

4. I believe the information provided herewith is sufficient to warrant a revision of the Report so as to reflect a more objective and understanding approach of this matter. Should you deem it appropriate to

Lockheed-Ga. Co. ltr to United States General Accounting Office,  
Attn: Mr. Solon P. Darnell, dated 20 March 1980, Subject:  
GAO Audit of Contract F33657-78-C-0306 (LGD/757581)

-2-

obtain additional information or wish to discuss this matter further,  
please do not hesitate to contact me.

LOCKHEED-GEORGIA COMPANY



J. M. Chamberlain  
Vice President - Finance

JMC:gr

Attachment

Attachment to LGC Letter to U. S. GAO  
Dtd 20 Mar 80 (LGD/757581)

For convenience, references used herein correspond to those in the GAO Report. Section designations have been provided for organizational purposes.

Section I.

Reference Page 1: 1/  
CONTRACT PRICE INCREASED BY NONCURRENT, INCOMPLETE,  
AND INACCURATE COST OR PRICING DATA

Lockheed does not agree with the conclusion that the negotiated contract price was increased by about \$910,265 because proposed costs for production material and development labor were not based on current, complete, and accurate cost or pricing data. The reasons for this disagreement are stated below.

Reference Page 6: Production material

The GAO alleges that Lockheed overstated proposed costs for production material because of a failure to update its proposal for specification changes and the use of noncurrent vendor quotes for three items. These allegations will be discussed in the same order indicated in the Report.

Reference Page 6: Failed to update proposal

Lockheed and the Government entered into Letter Contract F33657-78-C-0306 effective 15 March 1978. The letter contract was to be negotiated and definitized within 120 days after the effective date at a firm fixed price not to exceed \$52,400,000.00. On 8 May 1978 a detailed price proposal was submitted to the Air Force. Thereafter negotiations commenced and were completed on 15 June 1978. The definitizing document is designated as Supplemental Agreement PZ0003, bears an effective date of 26 June 1978 and established a firm fixed price of \$49,400,000.00. Included therein was the impact of configuration changes directed by P00002 which the GAO Report alleges as being the subject of an overstatement in the amount of \$642,299.00. The GAO derived this figure by simply comparing the deleted material cost against the material cost of items added without consideration of other factors and the nature of the actual negotiation process. Since the Report does not treat these other factors, it is difficult for Lockheed to adequately respond to the "overstatement" conclusion. Notwithstanding, the following comments are provided for GAO consideration.

During the period between issuance of the letter contract and June 15, 1978, there were various discussions between the parties regarding specification changes and the definitization thereof. Normally, and as suggested by Lockheed, such changes would have been processed as Engineering Change Proposals with the use of not to exceed

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1/Where warranted, page references have been changed to show where comment is applicable in the final report.

prices (as later supplemented by firm detailed price proposals) to be negotiated at a future date. During the negotiations the Contracting Officer directed that this procedure not be followed. The Contracting Officer desired to incorporate the specification changes into the over-all contract price negotiation without requiring any detailed price proposal. Considering this circumstance, as well as the limited time available for analysis of the impact resulting from the changes and the need for expeditious completion of the negotiations, the Government was advised that to minimize the impact, contractual authorization would be necessary on or before 9 June 1978. Various factors such as supplier cancellation charges and one-time labor costs relating to the changes were discussed by the parties. Even though there was no separate negotiation of the impact resulting from the changes, both parties were aware of all of the circumstances. The Government provided such authorization on 12 June 1978 with the issuance of Change Order P00002.

Considering the above circumstances, and the fact that the not to exceed amount of \$52,400,000.00 was unaffected by the changes, it is difficult to understand the basis of GAO's allegation. The Report is devoid of any consideration of the costs referenced above. Lockheed provided such facts as existed up to the time of agreement, complied with all requests of the Government's representatives, and negotiated the price of the contract in accordance with applicable regulations and statutory authority. Both parties possessed the same information and given the time constraints and direction from the Contracting Officer, the negotiation was completed in a timely fashion. In the absence of some specific rationale supporting the GAO conclusion, Lockheed is unable to provide any further definitive response. Based on the foregoing, Lockheed does not understand the basis for the assertion that the Contracting Officer did not request an updated proposal because of his reliance on "Lockheed's assurances that contract costs would not be significantly affected by the changes."

Reference Page 7: Noncurrent vendor quotes

- a. Part number AN/APN-169: This discrepancy was resolved during the contract negotiation pursuant to DAR 3-807.10(b).
- b. Part number 3S60D102D1: Negotiations were conducted on a lump sum basis rather than on an individual parts basis. During the negotiations Lockheed made several lump sum reductions for material costs. This was consistent with the conduct of the negotiations and its overall purpose of reaching agreement on a fair and reasonable price. Thus, there is no basis for the GAO's contention or that the contract price was increased to the Government.
- c. Part number 100001-200: Same as b. above.

Reference Page 8: Excess usage

Since there was no overstatement as noted above, there is no overstatement regarding this item.

Reference Pages 8 to 10: Development labor and Manufacturing labor

The Australian contract was used as the basis for projecting the ANG system development labor hours. At the time of negotiations on the ANG contract the Australian contract effort was not entirely complete and thus had to be projected to completion before it could be used as the basis for the ANG contract. The GAO has taken the position that since the actual labor hours incurred as of June 9, 1978 on the Australian contract were less than projected for that date, the hours not expended would never be needed to complete the systems development effort and Lockheed should have revised its projected labor requirements for the ANG contract. In fact, however, the system development manhours are an estimate of the total effort required to accomplish the task, and to forecast exactly when the hours will in fact be incurred is a further extension of the estimate. Merely because the hours are not incurred during the months anticipated does not support a conclusion that the hours will never be required. Lockheed's projection was based on records which indicate that systems development activity continues beyond the first aircraft delivery. The USAF FY 74 (48) airplane contract supports this. Records contain information that 22% of the effort was expended after delivery of the first aircraft.

Lockheed contends that it was logical and necessary to assume that the systems development manhours for the Australian contract would continue to the level of 17,500 hours and were proper for projecting ANG manhours. Furthermore, given the nature of the ANG negotiation, in which each of the cost elements was not individually negotiated, there is no indication of an increase of the contract price. Significantly, on 24 May 1978 during negotiations Lockheed made a substantial reduction in this area which reduced the total hours below the GAO estimate of 22,589 hours. Thus, for these reasons there is no basis for this item.

Reference Page 10: Quality assurance labor and General and administrative expenses

Since the information presented above indicates that there was no overstatement of development labor, there was no resultant overstatement of quality assurance and general and administrative expenses.

Reference Page 11: Profit

The GAO method of adjusting profit at the proposed profit rate rather than the negotiated profit rate is arbitrary and inconsistent. Furthermore, since there was no overstatement of proposed contract costs, a profit adjustment of any type is inappropriate.

Section II.

Reference Page 2: PRODUCTION LABOR MAY HAVE BEEN OVERSTATED BUT  
COULD NOT BE EVALUATED

Lockheed does not agree with the conclusions stated in this paragraph. The GAO position, while not stated in a positive sense, appears to reflect a lack of understanding regarding Lockheed's cost accounting and estimating system for the C-130 program.

At this juncture, we believe it would be appropriate to provide some insight regarding some of the characteristics of the C-130 program from a contractual point of view, the procurement/manufacturing controls necessary for efficient and effective management of the program and Lockheed's cost accounting and estimating system.

During the late 1960's it became apparent that a world wide market existed for the C-130 aircraft. This market was demonstrated by increased procurement of the aircraft by various elements of the U. S. Government, as well as by foreign governments and commercial firms. Under these circumstances, Lockheed found itself engaged in the concurrent production of the C-130 type aircraft, in various configurations, for several different customers.

As the number of customers, other than U. S. Government, increased, the length of time diminished significantly between actual receipt of contracts and the corresponding delivery of aircraft. With the development of this trend, Lockheed concluded that to have an orderly production program it would be necessary that C-130 procurement/manufacturing activity be scheduled to establish procurement and production spans, even if it resulted in non-contractual commitments/expenditures on Lockheed's part.

Prior to Lockheed's decision to produce aircraft on this basis, its cost accounting system involved identification and assignment of costs directly to contracts. These contracts were predominantly U. S. Government and involved relatively large numbers of aircraft which were placed on contract prior to commencement of work.

When Lockheed started the manufacture of C-130 aircraft on a non-contractual basis, it became imperative to make certain independent decisions involving aircraft configuration, aircraft serial number assignment, production lot size and production rate (aircraft completions per month). Furthermore, Lockheed developed a baseline configuration specification for non-contractual aircraft. Thus, Lockheed would manufacture aircraft to this baseline specification until such time as the aircraft was identified to a specific customer. With reference to

aircraft serial assignment, individual ship serials were either opened, revised, or sold. The decisions regarding production lot size and rate reflected the economics of production, Lockheed's investment resources and its willingness to assume risk.

All the above described conditions resulted in a situation where Lockheed's existent cost accounting system became extremely difficult to administer. Accordingly, Lockheed evaluated various alternatives and concluded that the lot costing system, as currently employed, was the most satisfactory and equitable for all parties.

The C-130 lot costing system contains these basic characteristics:

- o Certain elements of costs are applicable to all C-130 airplanes in a lot regardless of configuration and/or customers. These costs represent common airplane production costs which are accumulated in work order series identified to the production lot.
- o Peculiar costs are those applicable to a specific airplane or group of airplanes in the lot for customer requested changes to the baseline configuration. These costs are accumulated separately by contract.

Furthermore, production costs of C-130 type aircraft are divided into three major phases, specifically: fabrication, assembly, and flight. The costs related to fabrication are accumulated on a lot basis; while the costs related to assembly and flight phases are accumulated based on actual labor hours expended on each aircraft. Thus, estimates for manufacturing labor are prepared by using historical data containing average labor hours per unit for fabrication. Estimates for the assembly and flight phases are based on actual individual aircraft labor hours.

Lockheed does not concur in the GAO's assertion that its production labor requirements are not based on current, complete and accurate cost or pricing data. Likewise, that proposed requirements cannot be reliably evaluated "... because of apparent weaknesses in Lockheed's cost accounting system."

The cost accounting system provides data for estimating manufacturing labor using the most recent historical cost data as described above. Such costs are also accumulated and reported on a lot basis.

This system is consistent with the requirements of the Cost Accounting Standards, Lockheed's Disclosure Statement and DD Form 633. There is no requirement for estimating, accumulating and reporting by individual contract as implied by the Report. The ANG contract (firm fixed price) was negotiated on the basis of price proposals submitted on DD Form 633. Except for the base material (priced bill of materials), the estimate for practically all other listed cost items was based on historical cost data derived from various reports. This estimating system is not a determination of the amount of costs for a unit of goods, nor is it required to be so for the purpose of meeting the standard of current, complete and accurate cost or pricing data. Rather, a purpose of the system is to arrive at the figures included in the proposal which constitute the process of forecasting a future result in terms of cost, based upon information available at the time. Thus, the proposal is only the end result of that process which demonstrates and represents the practices used by Lockheed in estimating costs. It represents derived unit cost developed on the basis of lot costing. We believe the Government has the capability and is able to audit, compare and verify the historical cost data supporting estimates used for pricing proposals. In fact, this capability has been amply demonstrated during the time the current system has been employed. Since implementation of the lot costing system, over 24 C-130 price proposals have been transmitted to the U. S. Air Force and Navy.

Based on the preceding discussion, Lockheed does not agree with the conclusions reached by the GAO regarding the alleged overstatement of production labor costs. Significantly, a test of the reliability and accuracy of Lockheed's cost accounting and estimating system is a comparison of the total negotiated cost of the FY 78 ANG contract with the actual cost incurred in the performance of the contract. The Lockheed negotiated cost being the result of the estimating system, whereas the actual cost is a result of the cost accounting system. Using this test, the following comparison may be made:

FY 78 ANG Contract

Total Negotiated Cost	\$44,161,788
Total Actual Cost	<u>\$45,044,053</u>
Difference	\$ 882,265

The above figures indicate that the actual cost was \$882,265 greater than the Lockheed negotiated cost or within 2% of the negotiated cost.



(The total negotiated cost includes changes.) Comments provided below should be considered in the context of the general information provided above.

Reference Page 2: Manufacturing labor

Contrary to the system described above, GAO contends that Lockheed should have used the USAF FY 74/75 data for projecting ANG manufacturing labor hours. The GAO apparently overlooked a very basic premise of Lockheed's proposal. The estimate was based on the concept of first establishing a baseline airplane cost and then estimating peculiar costs. Since the FY 74/75 USAF aircraft extended over several lots (42 - 47) they were not considered as an appropriate base for ANG estimating purposes.

The FY 74/75 USAF aircraft configuration consisted of numerous product improvements (treated originally as "peculiar"), the majority of which were eventually incorporated into the configuration of the baseline aircraft at Lot 46. Consequently, the manhour requirements associated with these changes were accumulated in the common work orders for Lots 46 and 47; previously this effort had been accumulated in contract peculiar work orders. The GAO failed to consider this circumstance, as indicated in its Report, last paragraph on page 10: "The decrease in labor requirements between the first 48 and the last 5 airplanes is probably due to (1) learning and (2) the decrease from 2,448 to 1,042 pounds in the weight of airframe changes for peculiar configuration features and systems affecting labor requirements." The decrease in weight was not due to a reduction in requirements since the FY 74/75 aircraft had identical configurations. In fact, the decrease in peculiar weight was the result of the FY 74 peculiars being incorporated into the baseline (common) of the FY 75 aircraft.

The GAO contends that FY 74/75 aircraft should have been used for estimating baseline manufacturing labor hours, rather than the Ecuadorian airplane. Lockheed used the Ecuadorian airplane since the data was more current than that derived from the FY 74/75 acquisitions. This is demonstrated by the fact that the Ecuadorian aircraft was a baseline aircraft in Lot 49, whereas the last USAF aircraft was manufactured in Lot 48. Using the Ecuadorian baseline, set-up adjustment and performance factor adjustments were made to the Lot 49 fabrication manhours to project the baseline fabrication requirements for the ANG airplane in Lot 53. Likewise, the assembly and flight manhours charged to the Ecuadorian airplane were representative of a baseline airplane and were adjusted for anticipated baseline changes and for peculiar paint requirements for the ANG aircraft in Lot 53.

By contrast, the GAO contention that the ANG airplane production manhours should be based on the average of the FY 74 airplane manhours

cannot be substantiated. The baseline airplane in Lot 47, which was manufactured concurrently with the last seven FY 74 contract aircraft, accumulated actuals of 52,027 total common production manhours. A baseline airplane in Lot 53, representative of the ANG time period, has actuals of 59,863 common production manhours. Thus, the Lot 53 airplane common production hours substantially exceeded the average FY 74 airplane common production hours. Significantly, the standard configuration (or baseline airplane) production manhours increased some 7,000 manhours during the period from Lot 47 to Lot 53. This increase supports the use of a Lot 49 baseline airplane (most current) plus predictable increases for baseline changes, performance trends and similar contingencies to project the ANG basic airplane.

Regarding the estimate related to peculiars, it is Lockheed's position that no real difference results since analysis would reveal that a theoretical first unit calculated from the FY 75 history would yield an hours/pound factor comparable to that obtained by the Egyptian factor used in the ANG proposal. The difference being that the process actually used by Lockheed was consistent with its normal estimating procedures. Furthermore, the record reflects (including the GAO Report) that the Air Force was aware of the FY 74/75 history.

Since no overstatement occurred in manufacturing labor hours, no adjustments to quality assurance, general and administrative expenses and profit are applicable.

For the above reasons, Lockheed reiterates its position that its proposal for production labor requirements was based on current, complete and accurate cost or pricing data. The cost accounting system used is adequate and meets applicable standards and procedures.

Section III. <sup>1/</sup>

Reference Page 11: PROPOSED COSTS FOR PRODUCTION LABOR NOT BASED ON RELIABLE EXPERIENCE AND ESTIMATING METHODS

Lockheed has devoted a considerable portion of this document to explaining its cost accounting system and for the sake of brevity this explanation will not be repeated herein. It is sufficient to state that the cost accounting system provides information adequate for reliably estimating manufacturing labor requirements and that the estimating methods are sound and in conformance with applicable standards and practices.

Reference Page 13: Cost accounting system; Fabrication labor hours divided equally between airplanes in a lot

In this section GAO contends that fabrication lot hours are overstated on some aircraft and understated on others. The example

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<sup>1/</sup>Because of actions taken by Government representatives, we have consolidated specific findings into the general statement of our findings.

presented by the GAO, which states that one aircraft required 22,273 standard parts while another required only 20,650 parts, requires some explanation. Engineering procedures utilized through Lot 54 required that all parts in a particular assembly be identified as peculiar even if just one part of the assembly was peculiar. Additionally, the standard parts variance between aircraft in a lot when averaged over the entire lot tends to reduce the variance, since most aircraft within the lot will be of reasonably similar configuration. Historically, Lockheed's production lots contain a mixture of common and peculiar aircraft. The over or understatement of fabrication lot hours are minimized because of this continual configuration mix from lot to lot. For example, the use of Lot 49 ANG fabrication hours to project Lot 53 (Air National Guard A/C Lot) proved to be very reliable and within the estimating range as demonstrated below:

	<u>LOT 53</u>	
	<u>Projection Based</u> <u>on Lot 49</u>	<u>Actuals</u>
Fab & other hours	<u>29,838</u>	<u>30,134</u>

This example again demonstrates the reliability of Lockheed's lot cost accounting and estimating system.

Reference Page 14: Parts transferred between lots without accompanying transfers of labor hours

The GAO assertions regarding this subject should be considered in conjunction with the following comments. Standard parts transferred between lots are accompanied by the transfer of the associated manufacturing costs. The cost transfers include material, labor and overhead. When historical data is used to project future lot production hours the actual manhours are examined in conjunction with such transferred costs and an appropriate adjustment is made to offset lot transfers as was done in the ANG contract. This procedure prevents labor requirements from being over or understated and allows for reliable estimating of contract costs.

Reference Page 15: Labor hours for fabricating peculiar parts accumulated by contract

The accumulation of fabrication hours for parts, peculiar or common, by airplane instead of by lot or contract would entail substantial cost to the Government. Therefore, Lockheed has found it more cost effective to accumulate peculiar costs by contract and common costs by

lot. Accumulating peculiar fabrication hours by contract is not detrimental in estimating future labor requirements as alleged by the GAO. Learning curves are utilized and benefits indicated therefrom are considered.

Reference Page 15: Labor hours for standard and peculiar configuration requirements combined in assembly and flight operations

Segregating assembly and flight peculiar requirements from the common requirements is readily available under the present lot costing system. This is achieved because of the existence of baseline airplanes being manufactured along with those of a peculiar configuration in the same lot which provides a sound basis for comparison.

Section IV.

Reference Page 11: ESTIMATING METHODS

Lockheed does not agree with the conclusion that the "estimating methods used by Lockheed were deficient or unsupported in several significant respects". The information presented by the GAO to support this conclusion is essentially the same as discussed in Sections II and III hereof. In an effort to preclude unnecessary duplication of response, each paragraph under "ESTIMATING METHODS" will not be directly addressed. It must be reemphasized, however, that Lockheed's lot costing system and estimating procedures are in compliance with applicable Cost Accounting Standards, Lockheed's Disclosure Statement and DD Form 633. There is no requirement for accumulating costs or to estimate costs by individual contract or aircraft. Furthermore, Lockheed's accounting and estimating systems are continuously being audited by outside audit firms, several different Government auditing agencies and its own internal audit organization. These entities have examined the current accounting and estimating systems and have considered them to be reliable for the intended uses.

An example of this is the estimate of Lot 53 fabrication hours. The total hours for Lot 53 were estimated at the time the lot was only 15% complete. Notably, the original projection which was used in the FY 78 ANG proposal turned out to be 99.1% accurate.

A further test of the accounting and estimating systems is demonstrated by the very close relationship between the Lockheed total negotiated cost of the FY 78 ANG contract and the total incurred actual cost. These figures show that the total projected cost was accurate within 2%. In addition, Lockheed's profit (before taxes) on the FY 78 ANG contract was less than 10% which also demonstrates that in the

final analysis the negotiated price was predictable, fair and reasonable for both of the contracting parties. Lockheed's procedures relating to the accumulation of costs and estimating are intended to provide a base for forecasting a future result in terms of cost based upon information available at the time.

Lockheed believes the information provided herein should leave little doubt that it has not overstated any costs and that its system is reliable for the purpose of providing accurate, current and complete data.