

**REPORT TO  
THE CONGRESS OF THE UNITED STATES**

**EXAMINATION OF  
THE PRICING OF FALCON MISSILES  
UNDER  
DEPARTMENT OF THE AIR FORCE CONTRACTS  
WITH  
HUGHES AIRCRAFT COMPANY  
CULVER CITY, CALIFORNIA**



**BY  
THE COMPTROLLER GENERAL OF THE UNITED STATES  
APRIL 1961**



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON 25

APR 14 1961

B-125071

Honorable Sam Rayburn  
Speaker of the House of Representatives

Dear Mr. Speaker:

Enclosed is our report on examination of the pricing of Falcon missiles under certain Department of the Air Force contracts with Hughes Aircraft Company, Culver City, California.

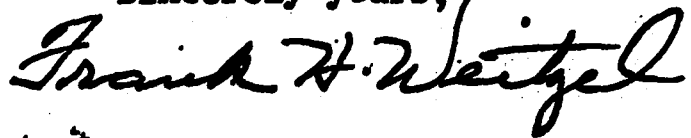
The report shows that contract prices were established for Falcon missiles without adequate evaluation, either by Hughes or by Air Force contracting officials, of all significant items of estimated cost included in the contractor's proposals. Appropriate evaluation of information available at the time the prices were established would have disclosed that certain of these estimated costs were higher than the costs which Hughes should have expected to incur. As a result of our examination, Hughes took action to obtain and pass on to the Government lower prices under certain subcontracts included in our review and, in addition, reexamined subcontract prices under a more recent contract not included in our review and obtained further reductions for the Government. These actions, together with adjustments for other cost overestimates disclosed by our review, resulted in savings to the Government of \$636,500. Also, Hughes informed us that it has initiated changes in its pricing procedures which are intended to assure that an adequate evaluation is made of cost estimates for its contract proposals.

While contract prices were adjusted in this instance, we believe that this procedure does not constitute an appropriate substitute for initially establishing equitable prices, based on thorough evaluation of all significant and pertinent cost and performance information available to the contractor and the contracting agency at the time the prices are established, since there is no assurance that equitable adjustments will be made. We are recommending to the Secretary of Defense that our findings in this case be brought to the attention of contracting officials of the military departments to illustrate the importance of thoroughly reviewing and evaluating the data supporting contractors' proposals to determine whether these data furnish sound bases for establishing fair and reasonable prices.

B-125071

This report is also being sent to the President of the Senate. Copies are being sent to the President of the United States, the Secretary of Defense, and the Secretary of the Air Force.

Sincerely yours,

A handwritten signature in cursive script, reading "Frank H. Weitzel". The signature is written in dark ink and is positioned below the typed name.

Assistant, Comptroller General  
of the United States

Enclosure

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REPORT ON EXAMINATION  
OF  
THE PRICING OF FALCON MISSILES  
UNDER  
DEPARTMENT OF THE AIR FORCE CONTRACTS  
WITH  
HUGHES AIRCRAFT COMPANY  
CULVER CITY, CALIFORNIA

INTRODUCTION

The General Accounting Office has examined the pricing of Falcon missiles under certain Department of the Air Force contracts with Hughes Aircraft Company, Culver City, California. Our examination was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), the Accounting and Auditing Act of 1950 (31 U.S.C. 67), and the authority of the Comptroller General to examine contractors' records, as set forth in 10 U.S.C. 2313(b).

In our examination we directed our attention primarily to those aspects which seemed to warrant particular attention. We made a selective review of the estimated costs for materials and subcontracted items, proposed by the contractor and accepted by the Air Force in establishing prices for Falcon missiles, in relation to information available at the time of price negotiations. We did not make an over-all examination and evaluation of the prices negotiated.

## BACKGROUND INFORMATION

Hughes Aircraft Company produces Falcon missiles and related equipment in a Government-owned plant, known as Air Force Plant No. 44, at Tucson, Arizona. Experimental models and the first production models of the Falcon missile were produced for the Air Force by Hughes under cost-plus-a-fixed-fee contract AF 33(038)-15826, dated June 26, 1951. The Air Force awarded Hughes follow-on fixed-price incentive contract AF 33(600)-28380, dated December 7, 1954, and this contract was converted to a firm fixed-price contract during negotiations concluded in June 1956.

Additional quantities of Falcon missiles were procured from Hughes under fixed-price incentive contract AF 33(600)-31694, dated February 1, 1956, which also was converted to a firm fixed-price contract in the June 1956 negotiations, and fixed-price incentive contract AF 33(600)-33916, dated March 21, 1957. These two contracts were amended on June 3, 1958, and September 3, 1958, respectively, to provide for development and delivery of 140 of the missiles as weapon system evaluator missiles (WSEM). The WSEM contains a signal data recorder for collection of data on in-flight operations of the weapon system for use in post-flight analysis and evaluation of the system's performance. The signal data recorder for the WSEM was developed by the Hughes research and development staff, Culver City, California, and its subcontractor, Hathaway Instrument Division, Hamilton Watch Company, Denver, Colorado. Hamilton Watch Company sold its Hathaway Instrument Division subsequent to the time of our examination.

Fixed-price incentive contract AF 33(600)-33916 provided for negotiation of a target price which included a target cost and a target profit and for a final price to be negotiated at completion of the contract on the basis of the costs actually incurred. As an incentive for the contractor to exercise efficiency and economy in performance, the contract provided that the target profit be increased by a stated percentage of the amount by which the final cost was less than the target cost or be decreased by a stated percentage of the amount by which the final cost was more than the target cost.

A listing of principal management officials of the Departments of Defense and the Air Force during the period of this report is attached as appendix I.

## FINDINGS AND RECOMMENDATION

### CONTRACT PRICES ESTABLISHED WITHOUT ADEQUATE EVALUATION OF ALL SIGNIFICANT ITEMS OF ESTIMATED COST INCLUDED IN THE CONTRACTOR'S PROPOSALS

Contract prices were established for Falcon missiles without adequate evaluation, either by Hughes or by Air Force contracting officials, of all significant items of estimated cost included in the contractor's proposals. Appropriate evaluation of information available at the time the prices were established would have disclosed that certain of these estimated costs were higher than the costs which Hughes should have expected to incur. As a result of our examination, certain reductions were made by Hughes in the contract prices, with savings to the Government of \$636,500, as summarized below.

Reduction in subcontract prices	\$445,570
Refund of duplicated tooling cost	149,840
Refund of overestimated cost of subcontract price increase	<u>41,090</u>
Total savings to the Government	<u>\$636,500</u>

### Subcontract target prices established on the basis of limited and incomplete cost and production information

In October 1957 Hughes issued two fixed-price incentive subcontracts to Hathaway for a total of 132 airborne signal data recorders at a target price of \$14,917.50 a unit. At the time the target price was established for these subcontracts, however, the design, development, and testing of prototype units of the recorder had not been completed and complete specifications for a satisfactory prototype were not available. Hathaway had delivered six of the prototypes to Hughes, but these prototypes did not function



properly, and certain essential components had been returned to Hathaway for further development. Consequently, it seems evident that the limited information available on Hathaway's experience under the preproduction prototype program, which was still in progress at the time, did not provide Hughes and Hathaway a reliable basis for establishing subcontract target prices in October 1957. On November 4, 1957, Hathaway advised Hughes that it had been required to provide for a considerable amount of direct labor in its quoted prices because of the many contingencies that existed. Hathaway stated, however, that it anticipated substantial savings in actual production of the recorders and estimated that it might be able at a later date to reduce its price by about \$3,000 to \$4,000 a unit. In January 1958 Hathaway made adjustments in the prices of certain component spare parts which, if projected over the requirements for a recorder on the basis of the number of each of the components contained therein, would have amounted to a price reduction of \$1,846 a recorder. Hathaway advised Hughes that price reductions for the recorders could not be made until "late spring."

On May 2, 1958, Hughes submitted to the Air Force a proposal for a firm fixed price for 28 weapon system evaluator missiles to be furnished under contract -31694, and on May 13, 1958, Hughes submitted a proposal for a target price for 112 weapon system evaluator missiles to be furnished under fixed-price incentive contract -33916. In these proposals Hughes included, as the estimated subcontract cost for the airborne signal data recorders to be incorporated into the missiles, the target price of \$14,917.50

a unit established with Hathaway 7 months earlier, as adjusted for reduced transportation costs. No recognition was given to the price reductions made by Hathaway for component spare parts, which would have amounted to \$1,846 a recorder, or to the price reductions for recorders which Hathaway advised Hughes it expected to make. Air Force contracting officials accepted the price proposed for these missiles by Hughes in establishing the firm fixed price under contract -31694 on June 3, 1958, and the target price under contract -33916 on September 3, 1958. We found no evidence that either Hughes or the Air Force contracting officials made an evaluation of the reasonableness of the subcontract target price established with Hathaway.

During our examination we found that in September 1958 Hathaway had advised Hughes that it was reducing its price for the recorders by \$1,049.75 per unit and that on January 20, 1959, Hathaway had refunded \$250,000 to Hughes as a reduction of amounts previously paid. Hughes had not made corresponding adjustments in its prices to the Air Force. Subsequent to our review of this matter with Hughes on May 11, 1959, substantially lower prices were established for the recorders under the subcontracts with Hathaway. These subcontract price adjustments, along with the September 1958 adjustment of \$1,049.75 per recorder, were included in amounts which Hughes passed on to the Air Force in July 1959 and April 1960 as (1) a refund of \$103,140 under firm fixed-price contract -31694 and (2) a reduction of \$387,910 in the target cost under fixed-price incentive contract -33916.

Hughes issued subcontracts to Hathaway under fixed-price incentive contract AF 33(600)-36650 for 399 recorders and related component spare parts. We did not examine these subcontracts, but, in reviewing the lower prices established under its subcontracts with Hathaway, Hughes found that the price reductions applicable to recorders obtained under prior subcontracts were applicable also to these 399 recorders. Hughes passed these additional subcontract price adjustments on to the Government as a reduction of \$828,140 in its target cost under contract -36650.

The reductions in firm prices and target costs under Air Force prime contracts, made by Hughes as a result of establishing lower subcontract prices with Hathaway, are summarized as follows:

	<u>Contract AF 33(600)-</u>			<u>Total</u>
	<u>31694</u>	<u>33916</u>	<u>36650</u>	
Reduction of:				
Firm contract price	\$103,140			\$103,140
Contract target cost		<u>\$387,910</u>	<u>\$828,140</u>	
Target profit--8.5%		\$ 32,970	\$ -	32,970
Target profit--8%		-	66,250	66,250
Incentive profit--20%		<u>77,580</u>	<u>165,630</u>	<u>243,210</u>
Savings to the Government	<u>\$103,140</u>	<u>\$110,550</u>	<u>\$231,880</u>	<u>\$445,570</u>
<u>Estimated cost of special tooling</u>				
<u>duplicated in follow-on contract price</u>				

Hughes' May 20, 1956, price proposal for contract -28380 included in the estimated material and subcontract costs an amount of \$119,708, plus related overhead costs which increased the total estimated costs to \$149,840, for special tooling to be manufactured or purchased for use in performing the contract. In an advisory report on an earlier price proposal for this contract, Air Force

auditors questioned these tooling costs on the basis that a provision had been made for the tooling under preceding cost-plus-a-fixed-fee contract -15826. However, in establishing a firm contract price for contract -28380 in June 1956, the records of negotiation show that Air Force contracting officials accepted, with only minor adjustments, the contractor's proposed material and subcontract costs.

According to the contractor's tooling records, the special tooling, for which \$149,840 was included in the firm price established for contract -28380, was not acquired under this contract. The records show that the tooling had actually been acquired by Hughes under preceding cost-plus-a-fixed-fee contract -15826 and that the Government had reimbursed Hughes for the cost of the tooling under that contract.

On May 11, 1959, we discussed this matter with Hughes, and subsequently, on July 24, 1959, the contractor refunded to the Government the amount of \$149,840 for duplicate tooling cost. In making this refund, Hughes advised the Air Force that the duplicate cost for tooling had been included in its price proposals by mistake and that it had been the contractor's belief that this tooling duplication had not been considered as a part of the costs during contract price negotiations.

Overestimated cost of subcontract price increase

Hughes' May 20, 1956, price proposal for contract -28380 also included in the estimated material and subcontract costs a provision of about \$228,300 for increases in the cost of subcontracts awarded to Solar Aircraft Company, Des Moines, Iowa, and for

related overhead costs. Solar had experienced unexpected difficulties in the performance of subcontracts awarded by Hughes and had incurred costs higher than anticipated, and in March 1956 requested price relief from the prime contractor. Although Hughes agreed with Solar that the subcontract prices should be increased, at the time Hughes submitted its May 20, 1956, price proposal to the Air Force, the prime contractor's own estimate of the increase in subcontract costs, plus additional information furnished by the subcontractor, showed that the total cost of the increase would be about \$41,090 less than the estimate of \$228,300 included in the proposal. During negotiations concluded in June 1956 to establish a firm price for contract -28380, Air Force contracting officials accepted the estimated cost included in Hughes' price proposal for price relief to Solar.

We discussed this matter with the prime contractor on May 11, 1959, and Hughes subsequently acknowledged that it could not reasonably have expected to pay, and in fact did not pay, Solar the full amount included in its May 20, 1956, price proposal. On July 24, 1959, Hughes refunded \$41,090 to the Government.

#### Subcontractor's comments

Hamilton Watch Company's comments on our findings, furnished in a letter dated October 17, 1960, are set forth briefly below and are included in full as appendix II to this report.

Hamilton stated that it felt the costs on which the contract with Hughes was awarded were adequate to set target prices and that the target prices proposed were realistic in light of Hathaway's experience. Hamilton also stated that the fact that Hathaway was able to produce the items substantially under the target cost was primarily due to a breakthrough in manufacturing

techniques, to excellent cost control, and, to some extent, to a pyramiding of follow-on contracts.

At the time Hughes established target prices for the fixed-price incentive subcontracts issued to Hathaway in October 1957 for 132 airborne signal data recorders, as shown on page 4, the design, development, and testing of the prototype units had not been completed and adequate specifications were not available. Hathaway had delivered six of the prototype units to Hughes, but these prototypes did not function properly and certain essential components were returned to Hathaway for further development. Further, the subcontractor advised Hughes by its letter of November 4, 1957, after the target prices had been established, that Hathaway had been required to make provision in its quoted prices for the many contingencies that existed.

It seems evident that, in the absence of adequate specifications or a workable prototype, sound bases were not available for reliable cost estimates on which reasonable target prices could be established for production quantities of the recorders.

Hamilton stated that it is the company's procedure to review its renegotiation status prior to the end of each year and, if it feels that any category of business made more money than the company feels it can retain under renegotiation, to determine the amount and refund those dollars to the largest customer falling under that category. Hamilton stated also that it is not quite correct to say that the amounts returned to Hughes were through Hughes' efforts or the GAO study, but that under any circumstances these adjustments would have been made by Hathaway under Hamilton policy and/or contract requirements.

The Government's costs of military procurements may in some cases be reduced by the contractors' surrender of a portion of their profits, or by price reductions in contemplation of a review

under the Renegotiation Act of their over-all profits on Government business. However, we believe that reliance on such procedures does not adequately protect the Government's interests. While contract prices were adjusted in this instance, we believe that price refunds or price reductions made to adjust unreasonably high contract prices do not constitute an appropriate substitute for the establishment of equitable prices based on a thorough evaluation of all significant and pertinent cost and performance information available to the contracting parties at the time prices are established. Postaudit procedures, particularly those applied selectively to contracts or to limited activities within a contract, provide no assurance that inequitable prices will be fully disclosed or that appropriate price adjustments will be made. Furthermore, there is no assurance that any of the increased costs borne by the Government for high contract prices will be recovered in renegotiation, since renegotiation proceedings are conducted on the basis of a contractor's over-all financial results experienced on its total business with the Government during a fiscal year, and not on an individual prime-contract or subcontract basis.

#### Prime contractor's comments

Hughes Aircraft Company's comments on our findings, furnished in a letter dated October 17, 1960, are set forth briefly below and are included in full as appendix III to this report.

Hughes stated that the review by the Air Force and Hughes of the factual findings and questions raised as a result of our examination not only had resulted in reaching agreement on the facts, but also in cash refunds and target cost reductions by Hughes, totaling some \$1,510,120, on four Air Force prime contracts, with savings to the Government of almost \$636,500. Hughes also

stated that as a result of our examination it had initiated changes in its prime contract pricing practices at its Tucson plant which it hoped would assure that adequate evaluation would be made of the estimated costs for all materials and subcontract items included in its missile contract proposals.

Our examination of the contracts selected for review at Hughes' was greatly facilitated by the contractor's cooperation and assistance. Also, as shown on page 7, Hughes not only took action to obtain and pass on to the Government lower prices under the subcontracts we reviewed but, in addition, reexamined subcontract prices under a more recent contract not included in our examination. As noted by Hughes, these actions by the contractor resulted in savings to the Government of \$636,500.

#### Air Force comments

The comments of the Office of the Assistant Secretary of the Air Force (Materiel), furnished in a letter dated February 27, 1961, are set forth briefly below and are included in full as appendix IV to this report.

The Office of the Assistant Secretary stated that our findings were carefully reviewed by the Air Force and that an adjustment amounting to \$636,501 was obtained from the contractor on account of the excessive costs. Although it was noted that the amount of this adjustment is small in relation to the total price negotiated for five contracts with Hughes, the Office of the Assistant Secretary stated that this does not minimize either the amount involved or the deficiencies which resulted in the excess cost to the Government, but rather "\*\*\*\* it is the position of the Air Force that, regardless of the amount involved, it is incumbent upon management to use each case to the fullest to help bring about more effective controls and tighter pricing."

In discussing problems involved in pricing military procurements generally rather than the immediate subject of this report, the Office of the Assistant Secretary stated that, although many important changes in the regulations and instructions governing defense procurement



have been made, "\*\*\*\* there is one aspect of this subject which is highly significant and which we believe merits further attention. This is the fact that, if sound pricing of military supplies is to be accomplished, not only the Government but industry also must fully understand and be prepared to meet the very serious responsibilities imposed upon it by the new policies and procedures. For example, the requirement for contractors to certify to the accuracy and completeness of the data used in preparing their proposals is not merely procedural; this is a basic substantive requirement. It recognizes a fact that has become increasingly evident as military equipment has become increasingly complex: If effective negotiations are to be conducted for supplies that may involve the costing of thousands of separate items and parts, it is essential that contractors' purchasing systems and estimating practices be efficient enough and dependable enough to assure the availability, when needed, of the data essential for sound estimating by the contractor and proper evaluation of prices by the Government."

We fully agree with the Office of the Assistant Secretary that prime contractors and subcontractors of all tiers must be held responsible for furnishing accurate and complete information for use in establishing prices which are fair and reasonable to the contracting parties. Our recent examinations confirm the statement of the Office of the Assistant Secretary that a wide variety of actions are being taken by the Air Force to improve contract pricing. The Air Force has been responsive to the findings disclosed by our examinations and has initiated action to provide more effective instructions and price-evaluation techniques for use by its contracting officials. While the stated objectives of the Air Force appear very comprehensive and sound, on the basis of our examinations to date we believe that a continuous and vigorous surveillance must be exercised by the military agencies over the administration and performance of defense contracts.

The Office of the Assistant Secretary stated that "\*\*\*\* in the pricing of many thousands of contracts,

involving billions of dollars annually, with limited numbers of personnel working within a reasonably limited framework of time, mathematically perfect results cannot realistically be expected. \*\*\* Under such circumstances, after-the-fact review of any complex procurement program will unquestionably reveal data and factors that were not known to the participants in the negotiations or were not thoroughly considered by them. \*\*\* Accordingly, post audits will continue to reveal cases in which costs were overestimated and 'excessive' profits resulted. Some of these cases--such as those covered in GAO reports--will also reveal opportunities for improving our estimating and pricing techniques. It is important, however, for anyone reading the results of such post-audits to recognize that the over-all effectiveness of existing policies and techniques cannot be measured by any individual contract standing alone. Such an evaluation is possible only by a review of the result of a fair and representative sample of procurement actions."

We recognize that in large and complex programs the conditions found in any one contract will not necessarily be representative of the manner in which the entire procurement program has been conducted. We believe, however, that every effort should be made to avoid decisions which are unsound on the basis of the information available at the time the decisions are made, and our reports are concerned primarily with matters of this kind. We also believe that the identification of mistakes made should serve as a basis for improvement of procurement procedures and practices.

### Conclusions

Our examination of the pricing of Air Force contracts with Hughes Aircraft Company disclosed that prices to the Government were based on estimated costs, certain of which were higher than the contractor should have expected to incur. We believe that a thorough review and evaluation by the Air Force of the contractor's price proposals and supporting data would have disclosed that these estimated costs were high in relation to the pertinent

information available at the time. The value of such a critical appraisal is demonstrated by the results of the review initiated by the contractor after we brought the matter to its attention. While contract prices were adjusted in this instance, we believe that this procedure does not constitute an appropriate substitute for initially establishing equitable prices since there is no assurance that equitable adjustments will be made.

#### Recommendation

We recommend that the Secretary of Defense have our findings in this case brought to the attention of contracting officials of the military departments to illustrate the importance of thoroughly reviewing and evaluating the data supporting contractors' proposals to determine whether these data furnish sound bases for establishing fair and reasonable prices.

## **APPENDIXES**

PRINCIPAL MANAGEMENT OFFICIALS  
OF THE DEPARTMENTS OF DEFENSE AND THE AIR FORCE  
DURING THE PERIOD OF THIS REPORT

DEPARTMENT OF DEFENSE

The Secretary of Defense

Robert S. McNamara	January 1961 to date
Thomas S. Gates	December 1959 to January 1961
Neil H. McElroy	September 1957 to December 1959
Charles E. Wilson	January 1953 to September 1957

Assistant Secretary of Defense (Supply and Logistics)

Thomas D. Morris	January 1961 to date
Perkins McGuire	January 1957 to January 1961

DEPARTMENT OF THE AIR FORCE

Secretary of the Air Force

Eugene M. Zuckert	January 1961 to date
Dudley C. Sharp	December 1959 to January 1961
James H. Douglas	May 1957 to December 1959
Donald A. Quarles	August 1955 to April 1957

Assistant Secretary of the Air Force (Materiel)

Philip B. Taylor	January 1959 to February 1961
Dudley C. Sharp	October 1955 to January 1959

Commander, Air Materiel Command

Gen. Samuel E. Anderson	March 1959 to date
Gen. Edwin W. Rawlings	July 1951 to February 1959



## HAMILTON WATCH COMPANY

Manufacturer of Fine Watches and Precision Instruments

LANCASTER, PENNA., U. S. A.

October 17, 1960

Mr. James H. Hammond  
 Assistant Director  
 United States General Accounting Office  
 Washington 25, D.C.

Dear Mr. Hammond:

Mr. Sinkler, our President, has asked me to write you concerning your preliminary draft of a report, which you were so kind to send to us with an invitation to comment, on your examinations of the pricing of certain contracts with the Hughes Aircraft Company.

Our desire to comment revolves around several statements made concerning our former division, Hathaway Instruments, and the Hughes Aircraft Company. The statements made are not quite exact, and we fear that they would lead to many misconceptions.

On Page 3, second paragraph, we disagree with your statement in that we feel the costs on which the contract was awarded were adequate to set target prices. It must be remembered that preceding the contract in question was a CPFF contract and a redeterminable contract. (These contracts had resulted in a loss to Hathaway of approximately \$250,000.)\* The target prices we proposed were realistic in light of our experience, and these figures were used in arriving at our bid. The fact that we were able to produce the items substantially under the target cost was primarily due to a breakthrough in manufacturing techniques, excellent cost control, and to some extent, a pyramiding of follow-on contracts. Had the cost elements known for consideration at the time of the writing of this contract been any more "set", then a firm fixed price contract should have been written as per instructions by A.S.P.R. As it was, a redeterminable type was chosen which under the circumstances was correct.

The only target price reductions actually made by Hathaway were the two mentioned on page 5 of \$1,846 and \$950. Pages 3, 5, and 6 state that Hughes induced us to give additional price concessions as a result of the G.A.O. study. It is true that Hughes did come to us asking if we would give additional price concessions. We replied that we obviously could not until the contracts had been audited and redetermined. This was done just prior to the end of 1959. The savings passed on by Hughes to the Air Force as coming from Hathaway were really the result of this redetermination, except for \$100,000. This latter figure was specifically spelled out as a renegotiation refund.

\*GAO comment: Our examination did not include a review of the final prices established by Hughes and Hathaway at completion of the preceding cost-plus-a-fixed-fee and price-redeterminable subcontracts.

APPENDIX II

Mr. James H. Hammond

(2)

October 17, 1960

In regards to the \$100,000, it is the Hamilton Watch Company's procedure to review its Renegotiation status prior to the end of each year. If we feel that any category of business (CPFF, Fixed Price, Other) made more money than we feel we can hold under Renegotiation, we determine the amount and refund those dollars to the largest customer falling under that category. The \$100,000, then, reflects upon several contracts, but Hughes being the largest customer in the "Other" category, we chose to give the money to them.

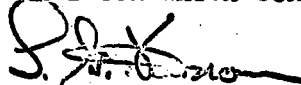
During the process of settling the contracts in question, we told Hughes that for their purposes with you they could handle the contract reductions that took place through redetermination along with the \$100,000 in any manner they saw fit as it was no concern of ours. But, as pointed out above, it is not quite correct to say that the amounts returned were through Hughes' efforts or the G.A.O. study; under any circumstances, these adjustments would have been made by Hathaway, under Hamilton policy and/or contract requirements. The \$250,000 Hathaway sent to Hughes (Page 5) actually was the result of an overbilling error. We expected to rebill for the \$250,000 returned at a later date but this proved unnecessary.

The amounts Hughes returned to the Air Force was in error by \$9,400. In trying to arrive at a quick Redeterminable and Renegotiation settlement with Hughes prior to our sale of Hathaway, and also so that they could settle with the Air Force, unaudited figures were used for billings. This was recognized at the time and a letter written to cover the fact and allow for later adjustment should the billing figures prove wrong after audit. As it happened they were in error by \$9,400, but as of this date, Hughes has refused to refund us this amount.

We do believe that the above information should be taken into consideration in your report.

Very truly yours,

HAMILTON WATCH COMPANY



L. G. Vernon  
Manager, Contract Accounting

LGV:EHP

**HUGHES AIRCRAFT COMPANY**CULVER CITY  
CALIFORNIA

October 17, 1960

Mr. James H. Hammond, Assistant Director  
Defense Accounting and Auditing Division  
United States General Accounting Office  
441 G Street N. W.  
Washington 25, D. C.

Dear Mr. Hammond:

This will acknowledge receipt of your letter of September 30, 1960 and of a copy of a preliminary draft of a report on your examination of the pricing of certain Department of the Air Force prime contracts with the Hughes Aircraft Company for the production of Falcon Missiles at Air Force Plant No. 44 in Tucson, Arizona.

As you know, during the past sixteen months we have worked closely with you and your staff, with the Manager of your Los Angeles Regional Office and his staff, and with the AFPR's Office and the AF Resident Auditor at Hughes-Tucson in a joint GAO-Air Force-Hughes review of the factual findings made and questions raised by your field auditors and of the views and positions of the Hughes Aircraft Company with respect thereto.

As the preliminary draft of your report shows, not only has this tripartite review resulted in an agreement being reached on facts but also in cash refunds and target cost reductions totaling some \$1,510,120 being made by the Hughes Aircraft Company on four Air Force prime contracts with concomitant cost savings to the Government of almost \$636,500.

In addition, we are pleased to report that also as a result of your audit findings and our joint review thereof we have initiated changes in our prime contract pricing practices at Hughes-Tucson which we hope will assure that adequate evaluation is made of the estimated costs for all materials and subcontract items included in our missile contract proposals.



**To: Mr. James H. Hammond**

**October 17, 1960**

**We wish to again express our sincere appreciation for the unfailing courtesy shown us by you and your staff and by Messrs. Harold L. Ryder and Maurice D. Shumer of your Los Angeles Regional Office, who from the beginning outlined for us in detail the factual basis of your auditors' questions and who always were willing to give consideration to the viewpoint of the Hughes Aircraft Company with respect to these questions.**

**With best personal wishes, I am**

**Sincerely yours,**

**HUGHES AIRCRAFT COMPANY**

By *R. E. Wendahl*  
**R. E. Wendahl, Vice President  
and Manager, Aerospace Group**

DEPARTMENT OF THE AIR FORCE  
WASHINGTON

OFFICE OF THE ASSISTANT SECRETARY

Feb 27 1961

Dear Mr. Hammond:

I refer to your letter of September 30, 1960, enclosing copies of a preliminary draft report on your examination of the pricing of Department of the Air Force contracts with Hughes Aircraft Company, Culver City, California.

This report has been carefully reviewed by Air Force personnel. The report finds that excess costs were incurred by the Government because (i) purchase orders placed by the contractor were overpriced due to the absence of reliable cost and production information, (ii) the contractor's estimate included charges for special tooling for which payment had previously been made, and (iii) the estimate included an excessive amount for the cost to the contractor of providing price relief to a subcontractor.

As noted in the report, an adjustment was obtained from the contractor on account of these excess costs. This adjustment amounted to \$636,501, which is somewhat larger than the figure shown in the report because of an additional target price reduction of \$166,505 negotiated by the Air Force.

Without question, this is a very substantial sum. However, to place it in perspective, it is worth noting that it represents 0.169% of \$376,190,360.09, the amount negotiated in five contracts with this company during the period from 1951 to 1958. This is not to minimize either the amount involved or the deficiencies which resulted in the excess cost to the government, but rather to place both in more realistic focus. With respect to the deficiencies, it is the position of the Air Force that, regardless of the amount involved, it is incumbent upon management to use each case to the fullest to help bring about more effective controls and tighter pricing.

The problems involved in the present report are basically similar to problems discussed in previous GAO reports. From our comments on these reports, the General Accounting Office is familiar with the many changes in the regulations and instructions governing Defense procurement that have been made since the transactions discussed in this report took place.

Current policies on the negotiation and pricing of Defense contracts strongly emphasize the requirement that contracting personnel obtain and carefully consider available cost and price data before reaching agreement on contract prices. We have informed the General Accounting Office of the importance that we attach to these policies and of the training measures and other actions we have taken to insure that they are thoroughly understood and effectively implemented by procurement personnel.

Although these policies and implementing procedures have been discussed with you in some detail, and have been favorably commented upon by your office, there is one aspect of this subject which is highly significant and which we believe merits further attention. This is the fact that, if sound pricing of military supplies is to be accomplished, not only the Government but industry also must fully understand and be prepared to meet the very serious responsibilities imposed upon it by the new policies and procedures. For example, the requirement for contractors to certify to the accuracy and completeness of the data used in preparing their proposals is not merely procedural; this is a basic substantive requirement. It recognizes a fact that has become increasingly evident as military equipment has become increasingly complex: If effective negotiations are to be conducted for supplies that may involve the costing of thousands of separate items and parts, it is essential that contractors' purchasing systems and estimating practices be efficient enough and dependable enough to assure the availability, when needed, of the data essential for sound estimating by the contractor and proper evaluation of prices by the Government.

The same is true in pricing contracts that may result in thousands of subcontracts and purchase orders of all tiers. For the Government to review the cost and price data pertinent to all of these transactions is obviously a physical impossibility. Instead, reliance must necessarily be placed on sampling techniques, test checks, audits, and similar measures to insure that contractors' purchasing systems can be reasonably relied upon to result in sound purchase order and sub-contractor pricing.

To achieve these objectives, heavy emphasis has been placed by the Air Force on its long-range program for the analysis and evaluation of contractors' purchasing and estimating systems. With the cooperation of industry, increasingly intensive efforts are being made to correct the deficiencies and weaknesses that these surveys have revealed.

Actions taken by Hughes Aircraft Company (the contractor referred to in the draft report) give some indication of the effect that this program is having. During the past several months, Hughes has made significant changes in its purchasing policies and practices and in its organizational structure. The purpose of these actions has been to assure greater use of technical specialists by buyers, increased availability of cost and price data, proper documentation of files, and reviews by management at both operating and corporate levels. A re-survey by the Air Force plant representative at the Hughes plant in October 1960 showed that as a result of these measures, significant improvement had been made in the contractor's purchasing procedures. In addition, the contractor undertook a complete re-examination of its estimating system as the result of a survey which the Air Force completed in September 1960. This has already led to a number of changes in the contractor's estimating organization, including the employment of a new director of material, with much further effort and additional measures in prospect for the future.

Without going into detail regarding the wide variety of actions being taken by industry and the Air Force in this effort to improve contract pricing, we are pleased to say that the response from business leaders and from industry generally has been highly gratifying. During the past year in particular, this program has received greatly increased attention from Air Force contractors. Numerous conferences and seminars have been attended by top levels of industrial management. Extensive correspondence has been conducted with the Air Force by individual companies and industrial associations. In turn, many companies have undertaken similar programs or have expanded existing programs to improve the estimating and purchasing systems of their suppliers.

On the basis of evaluations made by the Air Force and the detailed reports we have received to date from industry, we are confident that the Government is achieving significant benefits from this program in the form of reductions in the cost of military supplies and that further savings can be expected as improved methods of operations are developed and put into effect. It is evident, however, that this is a program of major magnitude and indefinite duration, not one that can be completed in the immediate future and forgotten. If the gains already made are to be preserved and if further progress is to be made, the program must be maintained as an integral element in the continuing effort to improve pricing techniques and reduce the cost of military supplies.

I would add one further comment that we feel is especially relevant to cases of the type discussed in the draft report. You will agree, I am sure, that in the pricing of many thousands of contracts, involving billions of dollars annually, with limited numbers of personnel working within a reasonably limited framework of time, mathematically perfect results cannot realistically be expected. Estimating is not a precise science but an exercise in personal judgment that involves not only the collection and examination of available cost and price data (which in many cases is voluminous) but also the weighing of the inevitable uncertainties and unknowns that have to be taken into account in evaluating this data and projecting it into the future.

Under such circumstances, after-the-fact review of any complex procurement program will unquestionably reveal data and factors that were not known to the participants in the negotiations or were not thoroughly considered by them. The prices agreed upon will invariably differ to some extent, upward or downward, from what they would have been if the additional data and factors had been known and taken into account. As a result, some contracts will result in losses and others in unexpectedly large profits, and, regardless of improvements in estimating techniques, this condition will prevail as long as prices are established in advance of contract performance rather than afterwards.

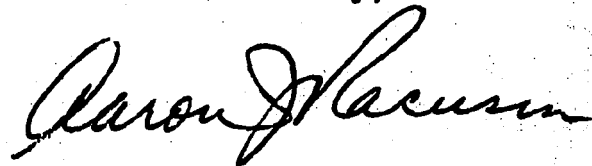
We could, of course, completely eliminate over-estimates and excessive prices by postponing pricing actions until after contracts are completed and costs are known, but this is a poor alternative since it would destroy the principal incentive that contractors now have to increase efficiency and reduce costs. Accordingly, post audits will continue to reveal cases in which costs were over-estimated and "excessive" profits resulted. Some of these cases--such as those covered in GAO reports--will also reveal opportunities for improving our estimating and pricing techniques. It is important, however, for anyone reading the results of such post-audits to recognize that the over-all effectiveness of existing policies and techniques cannot be measured by any individual contract standing alone. Such an evaluation is possible only by a review of the result of a fair and representative sample of procurement actions.

We appreciate this opportunity to furnish you with our comments on the draft report. Although our remarks have gone considerably beyond the immediate subject of the report,

APPENDIX IV

we hope they may be helpful in the further consideration called for by this important aspect of the problems involved in pricing military procurements. The job of dealing with these problems is one that will continue to require the persistent attention and efforts of industry and of all interested activities of the Government.

Sincerely,



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