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December 4, 1970

Mr. E. L. Grisich  
General Manager and Corporate  
Vice President  
Ventura Division  
Northrop Corporation  
Newbury Park, California 91320

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DLG 04263

Dear Mr. Grisich:

As promised, here is a detailed summary of our observations relating to the costs associated with the production of B-57 targets by Northrop Ventura. Hope this summary will have some management use, and no additional legwork is not necessary.

These observations supplement the draft report on "Application of 'Should Cost' Concepts in Reviews of Contractors' Operations" which was sent to the Secretary of Defense for comment on October 12, 1970. The results of our study were discussed with you and your representatives on July 22, 1970, and the comments included in Mr. Farnas's letter of November 16, 1970, were considered in this summary.

We were pleased to learn during our discussions with you and in subsequent meetings with DOD components of the constructive actions taken on most points. This is consistent with the cooperative and receptive approach to this undertaking that was in evidence from the outset.

We would like to express our appreciation to you and your staff for the assistance given us and the concern expressed for the success of the assignment. Recognizing that your participation in this review was voluntary, we were still very favorably impressed with the willingness of senior management group of your division to assist us in achieving the objectives of the review. Without their cooperation, our task would have been made much more difficult, if not impossible.

Sincerely yours,

H. L. Klinehan

H. L. KLINEHAN  
Regional Manager

Enclosure [Observations on Production Costs]

cc: Mr. J. Great Macdowell  
Vice President and Controller  
bcc: Assistant Director, DD - J. H. Stolarow  
Regional Manager, San Francisco Regional Office

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SUMMARY OF OBSERVATIONS

PERTAINING TO COSTS

TO PRODUCE

MIL-74A TARGETS

INTRODUCTION

The Los Angeles Regional Office examined into the costs associated with production of MIL-74A target drones by the Ventura Division of Northrop Corporation (Northrop Venture), Newbury Park, California. The targets are produced under annual fixed price-type contracts issued by the Naval Air Systems Command, as follows:

<u>Contract number</u>	<u>Type</u>	<u>Procurement Year</u>	<u>Number of targets</u>
NC0019-67-C-0456	PPF	FY 1967	217
NC0019-68-C-0412	PTI	FY 1968	350
NC0019-69-C-0395	PPF	FY 1969	354
H0001C-70-C-0424	I/C	FY 1970	293
		<u>Total</u>	<u>1,114</u>

Our observations pertaining to specific cost elements of labor, material, and overhead follow.

LABOR

ESTIMATING OF DIRECT  
LABOR COSTS

We found that current estimates of engineering and manufacturing labor hours and costs to produce the WNL-74A targets would be more reliable if the types of labor costs incurred under the initial production contract had been more carefully segregated. Careful segregation was necessary to develop a sound basis for estimating future follow-on contracts which were planned. We noted that improvements in varying degrees in accounting for certain types of manufacturing and engineering labor costs could be made in:

- Identifying project items and tasks from contract to contract.
- Establishing labor groupings and composite rates for a wide range of skills.
- Separating recurring and nonrecurring costs of production.
- Recording labor charges.
- Furnishing summary lot and parts cost data to Government representatives.
- Interrelating labor standards used by production with accounting records.

Practices in certain of these areas constituted impediments to estimating costs accurately and made evaluation of such estimates by Department of Defense (DOD) resident personnel difficult. Further, the data

furnished DOD negotiators was not as meaningful and helpful as desirable and reduced the opportunities of having negotiations result in what it should cost to produce a target.

A more detailed description of those practices follows.

Identifying project items  
and tasks

A job order cost system of accounting is followed with job orders identified to specific contracts. For cost recording purposes, each contract is divided into items and tasks. The items usually represent line items under the contract, and the tasks represent hardware subassemblies or overall labor functions under these items.

We noted changes in recording costs by item and task. For example, the items and tasks assigned for recording cost under the initial contract were changed for the second contract; the assignments for the third and fourth contracts were essentially the same as the second. Further, the accounting breakdowns for the hardware subassemblies on the initial contract were substantially changed, and production support, combined with regular production labor on the initial contract, was made a separate item on subsequent contracts.

Establishing composite labor  
exemptive and nonexempt categories

Engineering and manufacturing direct labor is segregated into a number of job classification codes. While these codes generally represent similar grouping of various labor tasks, the skill requirement and labor rate for

the particular tasks may vary substantially. For example, under four annual contracts awarded by the Navy since fiscal year 1967, about 83 percent of the engineering hours proposed were included in a single classification. This classification, as set forth in the financial instruction, included a variety of technical personnel, such as senior engineers and related technical personnel with salary ranges from \$300 - \$500 per week to cinematographers with a salary range of \$170 - \$250 per week. Similarly, 45 percent of the manufacturing labor hours proposed were represented by one labor classification which included machinists, sheet metal workers, assemblers, and painters. The salaries for these workers ranged from \$108 - \$123 per week for assemblers to \$166 - \$188 per week for machinists.

Proposals for engineering and manufacturing labor included the general labor classification discussed above without a breakdown of the specific types of labor needed. The labor rates proposed were a composite rate based on the actual rate being experienced in the plant for the workers charging these general classifications.

Separating recurring and  
nonrecurring costs

Production hours proposed for the contracts reviewed were originally estimated in 1967. These original estimates, updated for changes and adjusted based on an 85 percent industry-average improvement curve, were used in estimating the follow-on contracts. In January 1970, after producing about 567 units under the fiscal year 1967 and 1968 contract, the

actual production data was evaluated to verify the validity of the improvement curve used. It was found that the costs accumulated for the first 140 units contained recurring and nonrecurring costs and were, therefore, eliminated from the improvement curve calculation. We noted that various curves were developed, and the curve developed without the data from the first 140 units was finally proposed during negotiations. During our discussions with Navy representatives, we learned that this curve was basically the one used to determine the rate of learning to be negotiated, since additional production data was not available.

We were informed in one instance that proper separation of recurring and nonrecurring costs for the first 140 units was impossible because of the problems and changes experienced in producing these units. However, the need for segregation of recurring and nonrecurring costs should have been known in view of the anticipated follow-on orders. Production effort in the fiscal year 1967 contract, which became effective on March 30, 1967, occurred primarily in fiscal year 1968 and fiscal year 1969, and the last delivery under the contract was made in June 1969. Two follow-on procurements of this item were offered to Northrop Ventura before the deliveries on the first contract were complete; the contractor received RFQ's on January 12, 1968, for a 417-unit follow-on contract in fiscal year 1968 and on September 18, 1968, for a 354-unit follow-on order in fiscal year 1969.

From our analysis of the production data, various interpretations were possible. Our computations resulted in improvement curves different from those developed by your estimators which if used would have reduced the hours proposed and negotiated. For example, by excluding the cost data for the first 10 units on which production tooling was not used, but treating the 11th unit as the number one unit on the curve, we developed an 81 percent improvement curve. The extraordinary cost from the 11th to the 140th unit represents rework cost which would be reduced as learning increases. By using this curve, the labor cost proposed on the fiscal year 1970 contract would have been reduced by about \$144,000.

#### Recording labor charges

Employees assigned to a particular department when on temporary loan to another department are required to change the pre-coded timescards to show the code of the department for which they are working. We found that, in some cases, this was not done. For example (1) a labor code assigned to employee working on commercial products also appeared in the accounting records as a labor charge under Government contracts, (2) labor codes assigned to employees working under production support functions or departments show up as charges under the item designated for direct production work only, and (3) labor codes for direct production workers appear in the items designated for production support. The estimator stated that, in all cases, the worker is charging the correct contract, but has just failed to change the labor code. He also stated that this practice was not widespread or significant.

Furnishing summary  
lot and parts cost data

The original or source cost input for production labor is by part and lot. However, the basic cost record, the cost commitment report, is summarized by contract-line items and by hardware subassembly or labor functions. While lot and part data is available, a special computer run is required to accumulate the data in a format for easy use. We were told that, while this data has not been generally used by Northrop Ventura or the Defense Contract Audit Agency (DCAA) auditors for estimating or auditing purposes, it would be very valuable in establishing fair and reasonable prices. We were also told that it provides a quick look into the costs being experienced, an important factor on new production items.

Interpreting labor standards  
with productivity factors

Labor standards are used to determine the productivity and the efficiency of production operations, and labor performance reports are prepared and distributed each week for the major programs in process. Labor efficiency is determined by comparing standard hours earned based on equivalent output with actual labor hours incurred. Total hours are then compared with budgeted hours and an estimate to complete the project or contract is made. On major projects, the contractor knows the equivalent units produced each week and the number of labor hours expended in producing the units.

In discussions with manufacturing and accounting officials, we were told that the equivalent unit cost data developed by the production operations department for the contracts under review are not used for estimating or auditing purposes, and that the equivalent output data developed by the production operation department cannot be related to costs in the basic cost records at an interim point in the life of the contract. Such an interrelationship in the basic cost records, we feel, would be very useful tool in determining the per-unit cost being experienced during the life of the contract. Presently, unit costs are available in the basic cost records at the end of the contract or from a special computer run when lot cost is requested.

Agency comments

DOD auditing and contract administration personnel stated that they have identified in their pricing reports certain deficiencies in the contractor's accounting and estimating procedures, including the contractor's contention that insufficient data was available for applying learning curve techniques to estimate production labor hours. They found that over a period of years the contractor has made changes to improve its cost recording and estimating system. After the completion of our review, we were advised by DCA representatives that Northrop had furnished them a printout of production labor hours incurred by part number and lot on the fiscal year 1969 contract on which deliveries were currently being made.

### Conclusion

As indicated above, the records maintained on labor costs did not provide a clear separation of various labor cost elements in the early stages of the program or consistently from contract to contract. Sufficient visibility was not readily available to contractor management or the DOD auditors for the purpose of performing estimating or pricing reviews. The method of recording costs described above makes it impractical to compare or analyze costs from contract to contract over the life of the program and to develop acceptable improvement curve information and reliable estimates. We believe that improvements in the recording of costs in the early phases of new programs would provide a sounder basis for estimating costs on follow-on contracts. We also believe that greater visibility to available data would result in facilitating evaluations of proposals by DOD personnel.

### PROPOSED LABOR PRICING FOR FOLLOW-ON PRODUCTION CONTRACTS OF THE FISCAL 1968 AND 1969

Engineering labor costs were proposed on follow-on production contracts for the IGY-761 target at average hourly rates which included the rates for highly skilled engineers. The need for such engineering support on a stabilized production program had significantly diminished from the levels needed during the early production phase of the program. As a result, we believe that the engineering labor and burden costs proposed to price the fiscal year 1968 and 1969 contracts were in excess of what

the cost should be by about \$245,000. In addition, the amount proposed for engineering labor and burden costs, in our opinion, could have been reduced by as much as \$90,000 in negotiations for the fiscal year 1970 contract.

The work of designing and developing a fully operational system, along with the capability to produce it in production quantities, requires the efforts of highly skilled engineering and technical personnel. Under the initial production contract the need for these types of individuals was further increased due to the presence of design and development problems. As a program proceeds along in the production phase, the need for highly skilled engineers usually decreases. The major nonrecurring functions of production engineering are reduced, and the engineering effort supporting these activities is no longer needed. Also, the close control needed in the early phases of production is reduced as the engineering effort becomes primarily one of maintenance. Under these conditions, the engineering rates for follow-on contracts should decrease to reflect the diminishing skill levels needed to perform the recurring production support function. However, we found that the proposed rates on follow-on contracts significantly increased from the actual rate experienced on the first contract.

The Navy has awarded four contracts since fiscal year 1967 to produce and deliver the AQH-74A target in quantities of 217, 350, 354, and 223 units, respectively. The original contract also included effort for

production design, analysis, and test along with the development of a tooling capability to produce 50 units a month. Of the 133,123 engineering labor hours proposed under the first contract, 116,940 hours were for nonrecurring work, such as production design, analysis, and test. By the time the contract was substantially completed, engineering labor hours had increased to 225,000, or about 70 percent above the original estimate. Nonrecurring costs represented 74 percent of the total hours recorded.

Proposed engineering hours for the follow-on contracts decreased to an average of about 26,500 hours or about 12 percent of what was incurred on the first contract. The nonrecurring portion decreased from 74 percent on the first contract to a proposed average of about 11 percent on the second, third, and fourth. We were informed that the design and configuration of the target drone had been relatively stable effectively since the eleventh unit of the first contract, and that most of the design and production changes and rework were completed during the first contract by about the 140th unit. Navy representatives advised us that the target was within the state-of-the-art and that once the preliminary problems with the design were solved and the production capabilities were developed, production became a relatively routine and straightforward task. Deliveries under the first contract reached a level of 63, 57, and 67 during the last 3 months of the schedule, with 106 being delivered the following month under the second contract. Deliveries were made on schedule through the remainder of the second contract.

Our review showed that proposed engineering rates for the second, third, and fourth contracts increased from the actual rate experienced on the first contract of \$5.99 per hour to \$7.05, \$7.47, and \$7.71, respectively. We were informed by the former project engineer that this was due to the retention of higher priced engineers in order to maintain an acceptable level of capability within the company during a time when the work load and force had been decreasing. However, he stated that by using these engineers the work is performed at a higher rate of efficiency. He further stated that engineering employment had decreased from a high of 600 in 1968 to about 200 in 1970. As previously pointed out, the general engineering rate is proposed based on the experienced rate in the plant.

In order to determine the amount of possible increased cost to the Government stemming from the higher engineering rate, we compared the total cost to the Government based on the first contract base rate of \$5.99 with the total cost based on the proposed rate for subsequent contracts. The additional amounts proposed for engineering labor, including burden on the subsequent contracts already priced, was about \$245,000 and an additional \$99,000 on the fiscal year 1970 contract to be priced. No attempt was made to adjust the base amount for wage increases, since port or all of these increases were offset by using the first contract with its high skilled engineering requirement as a base.

While Mr. Plummer in his letter acknowledged that the engineering rate has increased as the effort changed from research and development to production, he did not agree with our conclusions, in total, as to the reasons for the increase. He said the reasons were threefold: (1) inflation, (2) reduction in requirements for lesser skilled engineers, and (3) need to have a few highly skilled engineers assigned that are capable of responding to various technical demands which may occur. We agree that there were reduced requirements for engineers, including the lesser skilled, but we do not agree that the sustaining and maintenance efforts required in a downstream production effort require the use of highly skilled engineers on a continuing basis.

#### Conclusion

We believe the engineering labor rates being proposed were at a higher level than necessary for the kinds of engineers required to perform the effort. In our opinion, it would be more equitable and meaningful if the estimate of engineering costs would show (1) the tasks required, (2) the specific type and hours of engineering or support labor required to complete the tasks, and (3) the hourly rates for each specific type of engineering or support labor.

## MATERIALS

### NEED FOR INCREASED PRICE COMPETITION ON CONTRACT PURCHASES OF MATERIALS

In our review of the procurement practices of Northrop Ventura, we found that effective price competition was not obtained for a substantial portion of the procurements reviewed. We estimated that effective price competition in buying selected materials covered in our review could have reduced the material procurement costs under the first four production contracts by up to about \$560,000. The need for increased competitive awards was recognized and procurement officials stated that they intend to obtain increased price competition on material purchases for the fiscal years 1970 and 1971 production contracts. On the basis of our findings for the first four contracts, the estimated potential savings in obtaining effective price competition for the selected materials under the fifth contract could total about \$150,000.

ASPR 1-300.1 states the general policy that all procurements, whether by formal advertising or by negotiation, shall be made on a competitive basis to the maximum practicable extent. A basic principle of contracting cited in ASPR is that where an award is based on effective price competition there is reasonable assurance that the contract price represents a realistic pricing standard, including a fair return on investment to the seller.

In evaluating the procurement practices, we selected 16 items from the bill of materials submitted for the third contract. While we selected less than 2 percent of the total 1,040 items used on each target, the 16 items represented \$10,094, or about 73 percent, of the \$13,765 estimated material costs per target. We identified 74 purchase actions taken on the items under the first four production contracts and determined the basis for award of the purchase orders.

We found that under the first production contract awarded in fiscal year 1967 effective price competition was obtained on a majority of the orders placed for the 16 items reviewed; subsequently, most of the orders were awarded on noncompetitive basis to the single or sole sources established on the first buy, as shown in the table below:

<u>Basis for awards of purchase orders</u>	<u>Fiscal years</u>				
	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>Total</u>
<u>Noncompetitive:</u>					
Single or sole source	10	9	13	3	35
Bids solicited but price competition not effective	1	9	3	5	18
Subtotals	11	18	16	8	53
Competitive	15	1	3	2	21
Totals	26	19	19	10	74

The value of the 74 purchases reviewed totaled \$11,421,323, including \$8,221,296 for engines which were purchased by the contractor for the first three contracts, but provided as Government-furnished equipment starting with the fourth contract. Excluding the costs of the engines (4 purchase orders), the competitive and noncompetitive procurements may be compared as follows:

		Purchased orders	
	Number	Amount	Percent
<b>Noncompetitive:</b>			
Single or sole source	31	\$1,532,311	47
Bids solicited but price competition not effective	18	721,510	23
Subtotals	49	2,253,821	70
<b>Competitive</b>	<b>21</b>	<b>946,211</b>	<b>30</b>
<b>Totals</b>	<b>70</b>	<b>3,200,032</b>	<b>100</b>

It was not possible to determine the amount of savings that would result from increased competition in the subcontract procurements. However, applying the 25 percent average savings factor (referred to in guidelines for reporting under the DOD Cost Reduction Programs) to the approximate \$2½ million noncompetitive procurements covered in our review (engines excluded), we can estimate that effective price competition would have reduced these material procurement costs for the first four production contracts by about \$560,000.

The predominant justification given for the single source procurements was that only one source was qualified, and that funds were not available for developing and qualifying additional suppliers. Most of the instances where quotations were solicited, but effective competition was not achieved, involved situations where the established supplier had a competitive advantage over the other potential suppliers. The advantage occurs because the supplier did not have to include in his quotation the

costs for qualifying his product, acquiring special tooling, engineering, or other startup costs. In our review, we noted that qualification testing was required for four of the 16 items included in our sample. The qualification costs for the four items totaled \$32,649, about 8 percent of the total \$407,267 purchase costs for the items.

A procurement official stated that quotations received from "qualified" sources were considered as providing competition. He said that qualification costs are segregated and analyzed separately, and that if the remaining cost is to the benefit of the Government an analysis is then made to determine the reasonableness of the qualification costs and the quantities that will have to be bought to provide for a return of investment. It is precisely because of the process described above that effective price competition usually is not achieved after the initial selection and qualification of a single supplier.

#### Conclusion

We believe that the costs of materials purchased by Northrop Ventura will be reduced substantially by obtaining increased competition. The major obstacle to achieving such competition in the past has been the additional costs associated with developing and qualifying new suppliers. The information developed in this review shows that at the start of a program such as this a maximum effort should be made to establish multiple qualified suppliers, particularly for major cost items, as a base for future

competition on follow-on orders. If the costs of developing additional sources are significant they might be set out as a separate line item on proposals for consideration by the buying agency.

LIST OF MAKING INSTEAD  
OF BUYING

Two major components of the MGM-76A target had been manufactured in-house since fiscal year 1967 without obtaining competitive price quotations from other potential suppliers. Requirements and orders for the components totaled about \$1,750,000 through fiscal year 1970. One of the items was not included in the make or buy program submitted to the Navy because spare parts requirements had not been considered in identifying items subject to formal make or buy determinations. Without competitive price quotations we could not determine whether making these items in-house was the most economical manner of acquisition.

The omissions raise doubts as to the adequacy of the contractor's programs in meeting the objectives of ASPR 3-902, Make or Buy Progress, which states, in part, that the responsibilities of a prime contractor include placing and administering subcontracts as necessary to assure performance at the lowest overall cost to the Government. The provisions of ASPR 3-902.2 define a make or buy program as "any" that part of a contractor's written plan which identified the major subsystems, assemblies, subassemblies, and components to be manufactured, developed, or assembled in his own facilities, and those which will be obtained elsewhere by

subcontract \*\*\*." It provides, generally, that the make or buy program will include items or work efforts costing 1 percent of the total estimated contract price, or \$500,000, whichever is less. Raw materials and off-the-shelf items are not to be included.

Use of cost analyses

We found only two instances where documented cost analyses were available in support of the make or buy decisions made. Such limited use of comparative cost studies appears inconsistent with the requirements of ASPR 3-902.3 which provides that when submitting a proposed make or buy program a prospective contractor shall state the reasons for his recommendations in sufficient detail for the contracting officer to determine that sound business and technical judgment has been applied. It further provides that proposed "make" items normally will not be agreed to, even if regularly manufactured or provided by the contractor, if the items are available (quality, quantity, delivery, and other essential factors considered) from any other firm at lower prices.

An official involved in the make or buy analyses told us that the primary consideration in determining whether to make or buy an item is whether or not they have the technical know-how and existing facilities to produce the item. Other officials stated that the primary consideration is to obtain the lowest overall cost to the Government, and that informal cost estimates or analyses are sometimes made by individual members of the Make or Buy Committee. However, as noted earlier, we found only two instances where cost analyses were documented.

An example of the foregoing type of decision is the decoder assembly which is a subcomponent of the guidance mechanism for the target. At the inception of the program, this assembly was identified as a "can make or buy" item with an estimated unit price of \$310. The assembly was then formally designated as a "make" item because a similar decoder assembly had been manufactured in-house for another target drone and the capacity to produce the assembly for the MGM-74A target was available. We found no evidence of a comparative cost study in support of the make or buy determinations for the decoder assembly for either of the target systems.

We were advised that under the earlier program the Navy in buying spare parts had asked for competitive quotations on the decoder assembly from several vendors, including Northrop Venture which won the competition. On this basis, they decided it would be cheaper to keep the work in-house on the follow-on program. We do not believe that such competition, which occurred in about 1964 or 1965, satisfied the need for a current comparative cost analysis in establishing the make or buy program for the latest target drone.

Identifying items requiring  
make or buy decisions

The make or buy programs submitted for each of the first four contracts were said to include evaluations of all the major subsystems, assemblies, subassemblies, and components currently estimated as costing 1 percent or more of the total estimated contract amount. However, our review indicated

that spare parts requirements were not adequately considered in determining which items required make or buy analysis in accordance with ASPR requirements.

We noted that the JATO carrier assembly was not included on the latest make or buy program even though substantial spares quantities of the item apparently will be required. As of March 1970, it was estimated that 7,564 JATO carrier assemblies were to be fabricated. The contractor's estimated unit price for these assemblies is \$184.63; the spares orders for these units would total \$1,392,870. The estimated prices of the first four contracts ranged from \$11,036,911 for the first to \$4,763,934 for the latest proposal on the fourth contract. The estimated costs of spares requirements for the JATO carrier assembly exceeds substantially the 1 percent contract price criteria applied to any or all of the first four buys.

We were told that the decision to retain this assembly as a make item was due to initial problems associated with the JATO launch. Since Northrop Ventura had total system responsibilities, it was decided to make the item in-house. However, we were advised that a make or buy analysis will be conducted to assure future procurement at the lowest cost to the Government.

#### Conclusions

The practices in performing and documenting make or buy evaluations for the contracts do not provide sufficient assurance of performance at

the lowest overall cost to the Government. It was not feasible in our review to determine whether excess contract costs have resulted from these practices and, if so, the amount of such costs. However, improvements are needed in performing and documenting make or buy evaluations so that contracting officers can effectively review and evaluate proposed make or buy programs on other contract work with the contractor.

OVERTHEAD

PROPOSED PRICES FOR VEHICLES INCLUDE  
OVERHEAD RATES AND PROFITABILITY

We found that projected overhead expenses were being proposed on sole source firm fixed-price follow-on contracts at higher than normal rates. The proposal to reprice fiscal year 1968 contract -0462 and the proposed prices for fiscal years 1969 and 1970 contracts -0396 and -0424, respectively, providing for delivery of a total of 927 vehicles, included increased allocations of about \$1,165,400. These increases are, in part, attributed to changes in the level of the direct cost basis on which overhead costs are distributed. In addition, these proposals apparently include amounts for the available but unused production capabilities and capacity of the contractor.

During the period from February 26 to May 7, 1970, proposals were submitted for a final price on the fiscal year 1968 contract and initial prices on the fiscal years 1969 and 1970 contracts. In the following table, the overhead rates included in the proposals are contrasted with the planwide 3-year average of those rates recorded under the first production contract awarded in fiscal year 1967.

	<u>Plantwide 2-year average<sup>1/</sup></u>	<u>Recorded under FY 1967 contract</u>	<u>Overhead rates provided under each contract</u>	<u>FY 1968 contract</u>	<u>FY 1969 contract</u>	<u>FY 1970 contract</u>
Engineering expenses	136.0%	149.0%	207.0%	244.0%	194.0%	
Manufacturing expenses	146.0	137.0	156.0	170.0	158.0	
Material handling						
Contractor-furnished items		8.3	8.5	8.2	8.1	6.6
Government-furnished items		.				6.2
Administrative	13.3	13.5	15.4	16.8	15.8	

<sup>1/</sup>Fiscal years ending July 31, 1967, 1968, and 1969.

Production of the 217 units under the first contract occurred primarily during fiscal years ending July 31, 1968, and 1969. The overhead costs for the year ending July 31, 1968, were substantially higher than prior years - in total amounts and in relation to the base used to allocate the expenses to contracts. Since the year ending July 31, 1968, appears to be an atypical year, we compared the overhead allocations computed by using the 3-year average plantwide rates with those contained in the three proposals as follows:

<u>Contract</u>	<u>Allocation</u>	<u>Percentage of increase over average</u>
FY 1968	\$ 459,300	14.6
FY 1969	565,100	18.0
FY 1970	162,000	8.3
	<u>\$1,166,400</u>	<u>14.6</u>

Although a portion of the increases in fiscal years 1963 and 1969 was due to an increase in production and inflation, we found that there was a substantial increase in expenditures of a discretionary nature. These increases were in excess of the relative increases in sales for those years.

#### Production capacity

During fiscal year 1967 through fiscal year 1970, there was an upward trend in production and sales volume as illustrated in the following table:

<u>Type of sales</u>	For the year ending July 31 (\$00's omitted)			
	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970 a/</u>
<b>Government</b>				
Fixed-price contracts	\$ 6,979	\$10,133	\$20,474	\$19,337
Cost contracts	<u>9,556</u>	<u>17,766</u>	<u>9,024</u>	<u>1,812</u>
Subtotals	<u>16,535</u>	<u>27,904</u>	<u>29,498</u>	<u>21,149</u>
<b>Commercial</b>				
Interdivisional		454	5,071	16,000
	<u>3,023</u>	<u>2,103</u>	<u>3,472</u>	<u>1,152</u>
Totals	<u>\$19,623</u>	<u>\$30,461</u>	<u>\$32,041</u>	<u>\$30,000</u>

a/ Forecast as of May 31, 1970.

The upward trend in production and sales volume for fiscal year 1969 was less than originally anticipated; furthermore, there has been a downward prediction in total forecasted sales since June 1969.

Despite the corporate increased sales volume since fiscal year 1968, there has been a substantial reduction in the number of employees at this plant; 1,872 as of June 30, 1968, to 1,178 as of March 31, 1970. We were advised that the primary reasons for the reduction included the discontinuance of a major program and a decrease in requirements for engineering effort on the MQM-74A target as the designs became stable. The direct engineering labor cost has been on the decline since fiscal year 1968. There were about 600 engineers employed in 1968 and about 200 had been retained as of April 30, 1970.

Sales backlog and forecasted sales do not indicate any significant change for the immediate future, since a decline in sales to \$33 million in fiscal year 1971 has been forecasted. Further, a decrease in direct manufacturing labor hours and costs occurred in fiscal year 1970 and is forecasted for fiscal year 1971. In anticipation of the decline, the budgeted overhead costs for fiscal year 1970 was reduced from \$16.1 million established at the beginning of the fiscal year to \$15.1 million established in May 1970. However, the action to reduce these costs was not taken at the same time or as swiftly as the reduction in direct labor output occurred.

We recognize that the increased overhead allocations were not the result of only excess or unused capacity. Another cause for the increase was the change in the direct cost mix, which represents the basis for distribution, from labor costs to material costs. Since the fixed indirect expenses continue to be incurred despite the change, the labor burden rates have gone up. Cost statistics confirm that the direct labor costs have been decreasing while material costs have increased.

For several months in 1969, targets were produced at the rate of about 80 units per month and currently are being produced at about 40 units per month. We noted that the monthly delivery schedule of the Navy's fiscal year 1970 contract for the targets decreased to 22 units per month; consequently, the labor base could further decrease in future years. The reductions in the labor base and monthly production requirements, in our opinion, add to the available unused production and engineering capacity.

Navy negotiating personnel stated that in May 1970 they negotiated lower overhead rates than those proposed by the contractor for the fiscal year 1969 contract. The rates proposed and negotiated on this contract were as follows:

Function	Rate (%)	
	Proposed	Negotiated
Engineering	244.0%	234.0%
Manufacturing	170.0	164.0
Material Handling	8.1	7.8
Administrative	16.8	16.1

We found that there were reductions in the amounts negotiated, but these reductions were considered to be the excess of what actual overhead costs should be.

#### Conclusion

The contractor's engineering and production overhead rates have increased substantially, and the rates proposed on follow-on contracts for the HQ-74A targets have further increased. The Navy, in our opinion,

when negotiating higher overhead rates will absorb a share of overhead costs which can be considered as representing the available but unneeded capacity and capability of the contractor.

In negotiating sole source contracts in an economic environment as currently exists, negotiators should have available analytical information that shows composition of proposed overhead costs, including (1) the reasonable share of overhead costs allocated to its contracts, plus (2) the additional amount a contractor plans to distribute to Government contracts because of its overall decreasing production requirements. With these types of data being available, the cost and benefits of sustaining the excess capacity of various contractors could be developed and more fully evaluated in terms of the economy and existing national priorities.