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Mr. Bernard B. Lynn  
 Director Defense Contract Audit Agency  
 Building 4  
 Cameron Station  
 Alexandria, Virginia 22314

Dear Mr. Lynn:

Enclosed for your information is a copy of a report that we recently issued to the Commander, Naval Air Systems Command (NAVAIR), covering defective pricing in NAVAIR's negotiated contract N00019-74-C-0131 with Texas Instruments, Inc. (TI), Dallas, Texas. As stated in the report, we also found that the Government contributed to a portion of the identified overpricing by overlooking and failing to incorporate in the contract price the lowest base shop labor cost proposed by the contractor. Irrespective of this latter deficiency, however, we believe the Government could have possibly negotiated a lower contract price if the Defense Contract Administration Services Office (DCASO) had not made certain assumptions and miscalculations in computing its independent system base shop labor estimate for the contract. DCASO's estimate of the base shop labor cost per system was the amount that was ultimately negotiated under the contract.

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We believe, also, that DCASO and the Defense Contract Audit Agency (DCAA) would have been in a better position to recommend, or justify, a lower contract price if they had coupled their independent estimates of the contract price with an evaluation of the contractor's historical labor cost data.

Since DCASO's estimate of the base shop cost was the amount negotiated under the contract, we estimate that the errors which DCASO made in computing its estimate may have contributed to the contract price being overstated by about \$836,000. We are reporting these matters to you and the Deputy Director of DCASO for your consideration in improving future evaluations of contract price proposals.

INTRODUCTION

Contract -0131, which was awarded to TI on October 1, 1973, was NAVAIR's fourth production buy of AN/APS-116 airborne anti-submarine

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warfare radar equipment for use on the S-3A aircraft. The contract firm-fixed-price of \$10,323,000 was negotiated at NAVAIR during the weeks of July 23, August 6 and August 20, 1973. This price included \$7,977,000 for 38 radar systems, spares components and technical data plus \$2,346,000 for an option to buy 12 systems which was exercised on January 16, 1974. The base shop labor contract price per system was \$10,542 for the 38 basic systems and \$10,152 for the 12 option systems, or an average price per system of \$10,448. TI's revised contract price proposal, which was dated July 24, 1973, amounted to \$12,748,828, including a base shop labor cost of \$9,810 per system. The contract was negotiated by NAVAIR based on, among other things, DCASO's and DCAA's independent estimates of the price of the planned contract work.

TI's accounting system provides rolled-up, run cost reports based on labor charges to work orders. Using these run cost reports and estimated equivalent radar systems produced, TI estimated base shop labor costs based on an improvement or learning curve analysis. Improvement curves graphically portray the relationship between cost and quantity of production units to adjust historical cost for anticipated labor efficiencies due to learning improvement.

To obtain system base shop labor historical costs for contract -0131, TI compiled rolled-up cost reports one and two (hereinafter referred to as Cost Reports 1 and 2) from selected work order cost data. TI estimated system base shop labor cost for contract -0131 by projecting Cost Report 2 historical cost to planned contract -0131 production units based on the rate of learning improvement experienced between Cost Reports 1 and 2.

DCASO and DCAA evaluated TI's initial base shop labor proposal by separately computing average system shop labor estimates of \$10,448 and \$8,610, respectively, for the 50 radar systems. DCASO's estimate was based on TI's historical labor cost from the Cost Reports 1 and 2 and DCAA's recommended rate of learning improvement. DCAA's estimate was based on historical cost from only Cost Report 1 and its selected rate of learning improvement.

#### ERRORS IN DCASO'S INDEPENDENT ESTIMATE OF CONTRACT PRICE

We found errors in DCASO's independent estimate of base shop labor cost and its estimate of two other cost elements of the contract. As a result of the errors made in the base shop labor estimate alone, the negotiated contract price may have been overstated by about \$836,000 since DCASO's estimate was the amount ultimately negotiated under the contract.

#### Base Shop Labor Cost

The price analyst who prepared DCASO's independent improvement curve projection of base shop labor costs made two errors which overstated the projection. These two errors involve the use of excess

numbers of equivalent radar systems or related cost for calculating improvement curve plot points.

Inclusion of R&D systems  
in plot point calculations

Thirteen Research and Development (R&D) systems preceded the first contract for the production radar systems. The DCASO price analyst included these systems in the plot point calculations, but excluded their cost in the improvement curve analysis. These R&D systems were built in a model shop environment rather than under production conditions. Consequently, the equivalent systems as well as related cost should have been excluded in the projection computation. The price analyst did exclude the R&D systems from improvement curve analyses for follow-on contracts. Also, TI excluded the R&D systems in projecting base shop labor costs for its revised proposal.

Assumption that TI's Cost  
Report 2 represented 24 systems

DCASO files show that before TI submitted its revised base shop labor price proposal, TI informed the Government that Cost Report 2 represented the 20th assembly system and the 29th fabrication system or the 24th equivalent whole system to date. (The 20 and 29 systems included 10 of the 13 R&D systems and TI's estimate of 6 equivalent systems under Cost Report 1, thereby leaving Cost Report 2 as representing 8 equivalent systems.) However, the DCASO price analyst misinterpreted this to mean that Cost Report 2 alone represented 24 systems and considered this number in projecting an estimated base shop labor cost per system. (NOTE: Our computations showed that Cost Report 2 represented 11 equivalent systems--see Appendix III to our letter to the Commander, NAVAIR, dated May 19, 1976.)

GAO's computation of the effect  
of the estimating errors

The DCASO price analyst recommended two base shop labor figures to NAVAIR for contract -0131: \$10,542 each for the 38 basic systems and spare components and \$10,152 each for the 12 optional systems (\$10,448 average for the 50 systems). We recalculated DCASO's estimate, correcting for the errors discussed above, based on the assumption that TI's estimates of equivalent systems for Cost Reports 1 and 2 and cost for Cost Report 2 were correct. This resulted in a projected system base shop labor cost for the 38 basic and 12 optional systems of \$8,908 and \$8,551, respectively, or an average system cost of \$8,802 for the 50 systems. By applying quantity extensions, negotiated add-on factors, overhead and profit rates, we derived an \$836,016 overstatement of negotiated contract price due to DCASO's base shop labor estimating errors.

Other Cost Elements

Overage and scrap factor

DCASO recommended an 8 percent overage and scrap factor based upon the difference between historical materials cost per system of \$63,637

and proposed cost per system for contract -0131 of \$56,587. The computed difference was \$7,050, or about 12.5 percent, which was deemed to represent overage and scrap. DCASO judgmentally reduced this to 8 percent. However, the \$56,587 reflected anticipated material price decreases totalling about \$6,169. At best then, only \$881 (\$7,050 less \$6,169) could be overage and scrap. The \$881, therefore, represented an overage and scrap rate of only about 1.5 percent; i.e.,  $\$881 \div \$57,468$  ( $\$63,637 - \$6,169$ ).

NAVAIR negotiated a 5 percent overage and scrap factor.

#### Other costs

DCASO recommended \$71,844 to NAVAIR for the amount of the other cost element of the contract. However, since general and administrative expenses totalling \$11,972 were erroneously included in DCASO's estimate, the recommendation should have been \$59,872. NAVAIR considered the exact dollar amount (\$71,844) recommended by DCASO to be the negotiated amount and justified its action on the basis that the percentage relationship of the amount to the total of all direct costs was reasonable.

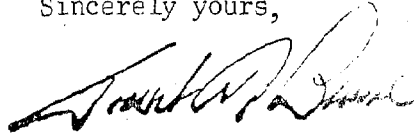
#### GOVERNMENT'S FAILURE TO EVALUATE TI'S HISTORICAL COST DATA

Neither DCASO nor DCAA evaluated the historical cost data which TI submitted to support initial and revised proposed base shop labor cost estimate for contract -0131. Instead, DCASO and DCAA computed independent shop labor estimates for the contract using certain of TI's historical cost data. As previously stated, DCASO estimated an average base shop labor cost of \$10,448 per radar system based on TI's historical labor cost from Cost Reports 1 and 2 and DCAA's selected rate of learning improvement; and DCAA estimated a per system labor rate of \$8,610 based on TI's historical labor cost from only Cost Report 1 and its selected rate of learning improvement.

We believe that if DCASO and DCAA had evaluated TI's historical cost data, they would have identified the discrepancies in the cost data as disclosed by our review (see our letter to the Commander, NAVAIR, dated May 19, 1976). This identification would have provided DCASO an indication that its estimated shop labor cost per system was possibly in error (an average of \$10,448 versus our estimate as disclosed in our defective pricing report of \$8,814), and would have provided DCAA additional support to justify its recommended per system base shop labor cost.

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We would appreciate a written reply within 45 days expressing your views and comments on the applicable matters discussed herein.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Forrest R. Browne". The signature is written in a cursive style with a large, prominent initial "F".

Forrest R. Browne  
Regional Manager

Enclosure