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Subcommittee on Defense, Committee on
Appropriations, House of Representatives

November 1987

COST ACCOUNTING STANDARD 414

How DOD's Budget Profit Policy and Contractors' Investments Relate to Standard 414



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National Security and
International Affairs Division

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November 3, 1987

The Honorable Bill Chappell, Jr.
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

In response to your September 18, 1986, letter and subsequent discussions with your representatives, we reviewed the relationship of Cost Accounting Standard (CAS) 414, "Cost of Money as an Element of the Cost of Facilities Capital," to the Department of Defense's (DOD) budget request and contractor profit. We also reviewed the uncertainty surrounding the level of funds associated in the procurement process with CAS 414. These funds consist of cost of money¹ and profit on facilities capital employed.² Our objectives were to

- determine how the Army, Air Force, and Navy treat these funds in their budgeting process and assess the practicality of identifying these funds in each service's budget request;
- identify the amount of funds negotiated by each service for cost of money and profit on facilities capital employed; and
- identify the contractors with whom each service negotiated the largest amounts of these funds and visit some of them to obtain information on the
 - cost of money received,
 - amount of money expended for capital investments, and

¹An imputed cost determined by applying an interest rate, published by the Department of the Treasury, to a contractor's net book value of facilities capital.

²An amount of money in the overall negotiated contract profit representing profit awarded on facilities capital identified by CAS 414 as being employed on the contract.

-- investments made and their cost reducing or productivity enhancing functions.

For more than a decade, cost of money and profit on facilities capital have been part of the DOD's profit policy. In the early 1970s, DOD was concerned about the reluctance of defense contractors to invest in capital facilities that would improve their productivity and lower the cost of their products. To address these concerns, DOD undertook a study called Profit '76. After completing the study of its policy to award profit based on contract cost, contract risk, and past performance, DOD made changes to its profit policy that it hoped would encourage investments by defense contractors. These changes and CAS 414 became effective October 1, 1976. CAS 414 provides a method for consistently measuring a contractor's cost of money and allocating these costs to specific contracts. Simultaneously with the issuance of CAS 414, DOD made the cost of money an allowable cost on its negotiated contracts and linked the profit it awarded on negotiated contracts to the amount a contractor invested in capital facilities.

In summary, we found that the portion of the military services' budget requests that is associated with CAS 414 are identifiable only at the start of the budget review and approval process when such cost elements as labor, overhead, and material are estimated for a program. As the budget estimate moves through the process, the identity of individual cost elements is not maintained. However, a general estimate of the funds associated with CAS 414 can be established for each service's budget request.

Our analysis of DOD data shows an annual average for the services has ranged from 2.4 to 3.3 percent during 1981-1986. During this period, the three services negotiated the following dollar amounts: Air Force \$1.93 billion, Navy \$1.97 billion, and Army \$567 million. The percentages for each service on an annual basis are shown in appendix II.

We identified the defense segments of the corporations with whom each service negotiated the largest amounts of cost of money and selected nine of them for further examination-- three different corporations for each military service. From these nine segments, we received data showing that during the years 1981 to 1985, they received a total of about \$910.8 million for cost of money. (See table III.1.) The segments did not maintain records of how much profit on facilities capital employed they negotiated, so we had to

estimate that amount based on contracting officers' reports showing that profit negotiated on facilities capital employed was about equal to cost of money negotiated by DOD. Therefore, we estimate the nine segments received about \$1.82 billion, while according to the contractors, during the same years, the nine segments made capital investments of about \$2.76 billion. (See table III.2.) Approximately 72 percent, or \$1.98 billion, was for acquisition of machinery; equipment; and related assets and 28 percent, or \$776 million, was for land; buildings; and improvements. (See table III.3.)

The contractors provided us numerous examples of capital investments that they said would result in increased efficiency or productivity for their defense segments. (See table III.4.) Contractor officials told us that the inherent risks of capital investments are reduced by the cost recovery elements of CAS 414. Officials from several defense segments noted that DOD's profit policy improves the viability of their projects which must compete with the investment projects of the corporation's commercial segments.

This report was discussed with responsible DOD officials, who generally agreed with its contents. As requested, we did not obtain official agency comments. Details on our findings, as well as a description of our objectives, scope, and methodology, are included in the appendixes.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this briefing report until 5 days from the date of the report. At that time we will send copies to Congresswoman Barbara Boxer, other interested parties, and makes copies available to others upon request. If you have any questions please call me at (202) 275-4587.

Sincerely yours,



Paul F. Math
Senior Associate Director

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ABBREVIATIONS

CAS	Cost Accounting Standard
DFAIR	Defense Financial and Investment Review
DOD	Department of Defense

CAS 414 AND ITSRELATIONSHIP TO DOD'S PROFIT POLICY¹

Profit is the basic motive of business enterprise. Accordingly, it is DOD's policy to use profit to stimulate efficient contract performance. It is the government's policy that the best determinant of profit is competition. However, when competition is not available, some other method is needed to establish a profit level that will attract efficient contractors. In 1964 DOD developed a structured approach, called weighted guidelines, for estimating the level of profit to be negotiated on its contracts. The guidelines included three main categories: (1) estimated contract cost (contractor effort), (2) contract risk, and (3) past performance as a basis to negotiate a reasonable profit. Under this approach, the contracting officer would select a specific profit rate from a range provided by the guidelines and apply the rate to a category.

During the late 1960s and early 1970s, DOD was concerned about defense contractors' reluctance to invest in productivity enhancing machinery and equipment in the performance of government contracts. To find out whether DOD's profit policy was a reason for the limited investment, DOD undertook a study called Profit '76. As a result of this study, DOD revised its profit policy effective October 1, 1976, under Defense Procurement Circular 76-3. A major revision of the policy placed less emphasis on contract cost and more on investments in capital facilities. In two important changes, DOD recognized

- the imputed cost of investment in facilities (cost of money) as an allowable cost on most negotiated contracts and
- the level of a contractor's investment in facilities as part of the basis for its prenegotiation profit objective.

Recognizing cost of money was made possible in part by CAS 414, which provides a method for consistently measuring the net book

¹Most of the information in this appendix was published in three of our reports: Cost Accounting Standard 414: Its Relationship to DOD Profit Policy (GAO/NSIAD-86-55, Mar. 14, 1986), Government Contracting: Assessment of the Study of Defense Contractor Profitability (GAO/NSIAD-87-50, Dec. 23, 1986), and Government Contracting: A Proposal for a Program to Study the Profitability of Government Contractors (GAO/NSIAD-87-175, Sept. 17, 1987).

value of capital assets a contractor uses on a specific contract. This net book value of assets then becomes the base to which an interest rate is applied. This rate is established by the Secretary of the Treasury pursuant of Public Law 92-41 (85 Stat. 97). The product of multiplying the Treasury interest rate by the net book value of assets is a contractor's cost of money. Also, DOD's policy created a profit factor linked to the amount of facilities capital employed. The standard provides a method for measuring the amount of facilities capital employed for a contract. This amount is directly related to the cost of money. The cost of money and profit on facilities capital employed represents funds associated with CAS 414.

COMPUTING THE COST OF MONEY AS AN ELEMENT OF CONTRACT COST

The investment base used in computing the cost of money for facilities capital is computed from accounting data used for contract costing purposes. The base is the average net book value of capital assets for a cost accounting period. The cost of money for a segment (e.g., a division of a company) for that period is calculated by multiplying the applicable Treasury interest rate times the net book value figure. The asset values are allocated to indirect cost pools, such as engineering overhead, manufacturing overhead, and general and administrative expense.

Cost of money is computed on the facilities capital in each indirect cost pool by multiplying the asset value assigned to the pool by the interest rate specified by the Secretary of the Treasury. For example, if the interest rate is 10 percent and the average net book value of assets assigned to a contractor's engineering overhead cost pool was \$1 million, the cost of money would be \$100,000 for a 1-year period. The cost of money for each overhead cost pool is added together to arrive at total cost of money for the contractor segment for the accounting period.

ALLOCATING THE COST OF MONEY TO A CONTRACT

Cost of money factors are computed for the assets attributable to each of a contractor's overhead cost pools by dividing the amount of cost of money by the unit of measurement of the distribution base--such as, direct labor dollars, machine hours, or total cost--used to allocate the expenses of each indirect cost pool. For example, an engineering overhead pool with a computed cost of money of \$100,000 allocated by direct labor dollars totaling \$5 million has a cost of money factor of 0.02 (i.e., \$100,000/\$5 million). The total unit of measure (direct labor dollars)

used to allocate an expense pool refers to all work done in the organizational unit, not just work done for the government.

To distribute the engineering pool cost of money to a specific contract, the total unit of measurement, that is, engineering direct labor dollars identified with the contract, is multiplied by the cost of money factor. Using the previous example, if the direct labor dollars from the engineering pool applicable to a contract is \$2 million and the cost of money is 0.02, the cost of money applicable to the contract from this pool would be \$40,000. This \$40,000 would be recognized as allowable cost on the contract. Other government contracts with the same contractor organizational unit would also have portions of the remaining \$60,000 in cost of money recognized as allowable cost. This procedure is repeated for each overhead cost pool.

COMPUTING THE PROFIT FOR FACILITIES CAPITAL EMPLOYED

Under DOD's profit policy, the amount of facilities capital employed assignable to a contract is directly related to the amount of cost of money which is, as described above, applicable to the contract. After the amount of cost of money for a specific contract is determined, the facilities capital employed is determined by dividing cost of money by the specified applicable Treasury interest rate. If, as in our example, the total cost of money allocable to a contract is \$40,000, then at a 10-percent Treasury interest rate for cost of money, the facility capital employed associated with the contract would be \$400,000. This dollar value of facilities capital employed on a contract is then used to calculate a profit objective for facilities capital employed. The 1976 policy set the prenegotiation profit weight for facilities investment between 6 to 10 percent. Thus, in our example, a profit objective for this facilities capital employed, calculated at the mid-point of the 6 to 10 percent weight range (8 percent), would be \$32,000.

NEW PROFIT POLICY PROVIDES BALANCED EMPHASIS BETWEEN COST AND FACILITIES INVESTMENT

DOD's Defense Financial and Investment Review (DFAIR) was conducted to (1) determine if contract pricing, financing, and profit policies provided for effective and efficient spending of public funds and the viability of the defense industrial base and (2) make recommendations for improvements. The DFAIR report was released in August 1985.

The DFAIR report concluded that, in general, the current contract pricing, financing, and markup policies are (1) balanced economically, (2) protecting the interests of the taxpayer, and (3) enabling U.S. industry to achieve an equitable return for its involvement in defense business. As a result of this report and section 9105 of the DOD Appropriations Act of 1987, DOD issued an interim rule concerning its profit policy which was published in the Federal Register on December 1, 1986. This interim policy was issued as a final rule in August 1987.

Our preliminary analysis of the final rule indicates no substantive change in the basic thrust of the new profit policy. DOD's new profit policy maintains the basic weighted guidelines structure but places less emphasis on contract cost in determining profit and more emphasis on investment in facilities and equipment as a profit determinant. We agree with the basic thrust that profit objectives should be increased for contractors willing to invest their capital in productivity enhancing equipment because of the potential for increased efficiency and lower overall costs.

We also agree that profit objectives should be lower for contracts in which price is based primarily on the contractor's costs. Contractors have little incentive to reduce cost when profits are determined as a percentage of costs because reducing costs will lower profits.

Under the new profit policy, material, labor, overhead, and general administrative costs are eliminated as specific factors to which profit is assigned. Investment in equipment is assigned a higher profit weight range than buildings, and land investment is dropped as a profit factor.

We believe the policy is balanced in its consideration of profit objectives for contract cost and contractor investments.

PROFIT POLICY MAY NOT ACHIEVE COMPARABILITY OF PROFITS

DOD concluded that profitability for defense business was very similar to that of durable goods manufacturers when the abnormal 1980-1983 period was excluded from a comparison of the two. Another conclusion DOD reached from the DFAIR was that its previous profit policy had resulted in a 0.5 to 1-percent unintended increase in profit objectives. A principal objective of the new profit policy is to reduce overall DOD profit objectives by 1 percent to bring defense contractors'

profitability more into line with comparable durable goods manufacturers.

DOD's goal of reducing profit objectives by 1 percent, from 12.3 to 11.3 percent, was based on 1980 to 1983² data. Using the latest DOD data² available, we examined whether the average negotiated profit objective of 12.3 percent is a valid benchmark from which to obtain the 1-percent reduction. We found that the overall weighted average profit objectives on negotiated defense contracts in 1985 had grown to 13 percent of costs. Therefore, a 1-percent reduction would result in profits of about 12 percent--not the intended 11.3 percent.

It should be stressed that over and above the question of whether the profit objectives in the policy will produce a 1-percent reduction, the 1 percent may not be enough to bring defense contractors' return on assets in line with comparable durable goods manufacturers, which was a goal implied in DFAIR. DOD should have a rationale justifying negotiation of profit levels that produce return on assets for defense contractors that, as we showed in our December 1986 report on DFAIR, more than doubled the returns earned by comparable durable goods manufacturers for 1981-83.

However, there is no systematic, recurring process for obtaining and analyzing actual profits earned to determine if the goal has been achieved. On September 17, 1987, we published a proposed program to study the profitability of government contractors. We recommended a profit program requiring

- a consistent and appropriate analytical methodology to evaluate profitability,
- a means to verify contractor-furnished data, and
- mandatory contractor participation.

Specifically, we recommended legislation to require major government contractors to annually report financial results to an independent government unit. The proposed legislation defines who will do the studies, the criteria for determining which companies will be subject to reporting requirements and sets forth essential program requirements.

²DD Form 1499 data system (Report of Individual Contract Profit Plan).

THE BUDGETING PROCESS OF DOD ANDCAS 414

The initial step in the budgeting process for the Army, Air Force, and Navy is the assembling of cost data for known or planned programs. In estimating the costs of their programs, the military services begin with cost elements such as labor, overhead, general and administrative, and material. Since the advent of CAS 414, cost of money has become one of the cost elements to be considered along with labor, overhead, and so forth. However, throughout the budget review and approval cycle, the identity of individual cost elements is not maintained. Because of this, the services and the Office of the Secretary of Defense budget officials stated that they cannot precisely identify, within the services' acquisition budgets, the amounts representing any particular element of contract costs associated with CAS 414.

CAS 414 FUNDS
CAN BE ESTIMATED

The services estimated that cost of money and profit on facilities capital employed have historically averaged between 1 to 3 percent of a contract's price. They based their estimate on data from DD Form 1499--Report of Individual Contract Profit Plan. The purpose of DD Form 1499 is to provide DOD a basis for analyzing profit negotiating patterns and weighted guideline profit objectives on defense contract actions. This form is required to be prepared for each negotiation of a contract involving a separate cost and profit that together total \$500,000 or more (32 C.F.R. 23-302(a)).

Our analysis of the 1499 data for fiscal years 1981 through 1986 is shown in table II.1. The table shows for each military service the average annual cost of money and profit for facilities' capital employed as a percentage of the contract acquisition cost.

Table II.1: Estimated Average Annual Cost of Money and Profit on Facilities Capital Negotiated by the Military Services for Selected DOD Contract Actions^a During the Years 1981-1986

<u>Year</u>	<u>Air Force</u>	<u>Navy</u>	<u>Army</u>	<u>Overall average</u>
------(percent)-----				
1981	1.5	3.6	2.1	2.4
1982	2.3	3.1	2.2	2.5
1983	2.5	4.5	1.4	2.8
1984	3.1	3.1	3.0	3.1
1985	2.7	3.6	2.1	2.8
1986	3.4	3.8	2.6	3.3

^aThere were 13,558 contract actions reported on DD Form 1499 data system at the time of our review.

The above figures are based on estimates and do not represent the actual cost of money and profit on facilities' capital employed the military services have awarded. DOD budget officials told us that it may be possible to obtain from the services' program offices the amounts originally budgeted for cost of money and profit on facilities' capital employed. However, the identification of these budgeted amounts is not maintained throughout the many changes a proposed budget encounters in the review and approval process.

HOW AND WHY THE NAVY IDENTIFIED
COST OF MONEY IN ITS
FISCAL YEAR 1987 BUDGET REQUEST

In hearings on DOD's 1987 Appropriations Act, the Navy estimated that its shipbuilding budget request had been reduced by \$150 million in cost of money funds. According to a Navy comptroller official, the shipbuilding portion of the budget request was reduced 1 percent to represent cost of money expenses.

In 1986 the Navy proposed changes to DOD's regulations that would have made cost of money an unallowable cost and doubled the profit factor on facilities capital employed. This profit factor would have emphasized investments in productivity enhancing equipment and decreased any emphasis on building and land investments. DOD did not disallow cost of money, but did increase the profit factor for investment in facilities capital with equipment receiving the greater emphasis.

These actions stem from the Navy's conviction that cost of money should not be an allowable cost for shipbuilders because it is a very competitive industry and competition will require shipbuilders to be efficient.

COST OF MONEY AND CAPITAL INVESTMENTDATA FROM NINE DEFENSE CONTRACTORS

Officials of nine defense contractor segments¹ (a division or subsidiary of a contractor that contracts with DOD) stated that the allowability of cost of money and profit on facilities capital employed are positive factors in their decisions to undertake capital investments, because these cost recovery elements reduce the inherent investment risks. Officials from several defense segments noted that DOD's profit policy improves the viability of their projects which must compete with the investment projects of their commercial segments.

In our review of the data provided by the contractors, we observed that each contractor's capital investment procedures were very specific and detailed. These procedures outline the process each proposed capital investment project must undergo to obtain management approval. These procedures and processes are documented in the contractor's policy and practice manuals. Generally, the contractor's procedures require each request for capital investment to include

- a synopsis of the current deficiency or need;
- a technical description of the asset to be purchased or leased and summary of how the asset will benefit the organization;
- the estimated cost of the asset acquired or leased;
- the projected date the asset will become operational and projected dates for expending funds; and
- a financial or economic analysis of the estimated benefits through a variety of techniques, including cash flow, payback period, and discounted rate of return analyses.

The contractors' procedures provide policy guidance for planning, appropriating, and monitoring of funds earmarked for the purchase and lease of assets. The first step in a contractor's control process is capital and lease planning. Each year, a contractor's segments are required to submit capital investment plans for approval. However, approval does not represent authority to commit or expend the funds.

¹A list of the defense contractor segments can be found in appendix V.

Before any capital investment funds can be expended, a segment must submit a request for capital funds. The request includes projects that were initially approved in the capital investment plan and projects not in the plan. This provides the contractor flexibility to adjust capital investment plans in light of the many factors affecting the contractor's economic condition. Authority to approve a capital investment is delegated to various management levels. For example, at one contractor, the Board of Directors approves all capital investment projects costing more than \$5 million. For projects costing \$5 million or less, approval authority has been delegated to the Chairman; for projects of \$2.5 million or less to the President; and so on.

The nine defense segments provided data on the cost of money they received and capital investments made during the 1981 to 1985 time frame. Tables III.1, III.2, and III.3 show the funds received and investments made by the segment and by category of investment.

Table III.1: Cost of Money Received by Nine Defense Segments for the Years 1981-1985

<u>Segment</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>Total</u>
	- - - - - (dollars in millions) - - - - -					
1	\$29.0	\$40.6	\$45.7	\$63.2	\$61.6	\$240.1
2	8.9	10.4	9.8	14.5	17.5	61.1
3	25.1	32.1	26.4	32.7	32.0	148.3
4	12.0	14.0	14.0	21.0	24.0	85.0
5	9.2	13.8	13.1	18.4	21.6	76.1
6	3.8	3.3	6.9	7.4	7.9	29.3
7	8.7	10.6	8.2	12.1	13.9	53.5
8	8.6	15.8	14.0	20.7	29.3	88.4
9	<u>1.0</u>	<u>9.0</u>	<u>27.0</u>	<u>44.0</u>	<u>48.0</u>	<u>129.0</u>
Total	<u>\$106.3</u>	<u>\$149.6</u>	<u>\$165.1</u>	<u>\$234.0</u>	<u>\$255.8</u>	<u>\$910.8</u>

Table III.2: Investments Made and Funds Received for Cost of Money and Facilities Capital Employed by Nine Defense Segments During 1981-1985

<u>Segment</u>	<u>Investments made</u>	<u>Funds received^a</u>
	- - - (dollars in millions) - - -	
1	\$496.3	\$480.2
2	218.6	122.2
3	288.8	296.6
4	344.5	170.0
5	93.4	152.2
6	220.9	58.6
7	209.7	107.0
8	373.3	176.8
9	<u>510.2</u>	<u>258.0</u>
Total	<u>\$2,755.7</u>	<u>\$1,821.6</u>

^aThe segments provided information on how much cost of money they had been awarded, but they do not keep records of how much profit on facilities capital employed they receive. Our analysis of the negotiated profit objectives reported on DD Form 1499 shows that contracting officers' records show a ratio of about 1 to 1 for cost of money and profit on facilities capital. The "funds received" were estimated by doubling the total column of table II.1.

Table III.3: Summary of Seven Categories of Capital Investments by Nine Defense Segments for the Years 1981-1985

Category	1981	1982	1983	1984	1985	Total	Percent of total
- - - - - (dollars in millions) - - - - -							
Land and improvements	\$ 7.9	\$ 10.6	\$ 4.9	\$ 31.1	\$ 29.8	\$ 84.3	3.06
Building and improvements	94.3	86.8	127.0	131.8	209.5	649.3	23.56
Leasehold improvements	5.0	14.9	13.2	7.2	2.6	<u>42.9</u>	<u>1.56</u>
Total						<u>776.5</u>	<u>28.18</u>
Office and lab fixtures	31.5	32.8	32.1	48.1	74.7	219.2	7.96
Transportation	2.1	0.8	10.2	2.9	1.8	17.8	0.65
Machinery and equipment	193.2	265.6	316.5	346.0	413.9	1,535.4	55.72
Other	<u>23.2</u>	<u>38.5</u>	<u>30.8</u>	<u>70.6</u>	<u>43.8</u>	<u>206.8</u>	<u>7.50</u>
Total						<u>1,979.2</u>	<u>71.83</u>
Total	<u>\$357.2</u>	<u>4449.9</u>	<u>\$534.7</u>	<u>\$637.7</u>	<u>\$776.3</u>	<u>\$2,755.7</u>	<u>100.00^a</u>

^aFigures may not add due to rounding.

Table III.4 lists examples of capital investments provided by the nine defense contractor segments. As agreed with your representatives, we did not evaluate the productivity enhancing properties of these investments. Also we did not verify the investments cited by the contractors or their expected benefits.

Table III.4: Examples of Capital Investments

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Automatic Cutter Grinding and Welding	Equipment reconditions tool cutters for reuse.	Equipment estimated to save over \$750,000 per year.
Gun Drilling Tools	Tools used to drill large diameter hole fasteners.	Faster drill times and improved hole quality. Estimated savings of \$651,000 per year.
Sheet Metal Center	Renovation and automation of production process for shearing, routing, drilling, deburring, parts identification, and material handling.	Automation of sheet metal center via a central computer allows interfacing with other systems, improves writing of orders and control of material requirements, tool control, and inventory control. Renovated and sheet metal parts center expected to save over \$3 million per year.
Composite Center	Planned automated center to manufacture pipe hangers.	Current production indicates 50-percent staff-hour savings.

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Profile and Drill Automation System	Computer controlled sheet metal fabrication.	Reduce labor intensive operation in sheet metal fabrication and reduce waste. Improved quality demonstrated with a .0008 percent rejection rate.
Trumpf Punch and Nibbler	Machine produces flat sheet-metal parts with multiple cut outs.	Reduce tooling require- ments with a 35-percent savings in labor costs.
ASEA Deep Draw Press	Machine replaces drop hammer forming of metal parts.	Uniform quality parts with less material and lower tooling cost. Expect a 27-percent reduction in production standards.
Glycol Quench	Equipment for quenching heat treated parts.	Facility allows con- tinuous monitoring and maintenance of the glycol bath. Invest- ment has led to a 35-percent reduction in labor.
Optical Character Recognition Data Entry System	Data entry equipment used to optically scan 25,000 daily timecards and generate magnetic tape for costs distribution.	Data entry equipment resulted in staff-hour savings equivalent to 15 employees (Released 13 keypunch operators and reduced overtime worked by payroll clerks to process attendance records).

<u>Capital asset purchased or Leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Pulsed Arc Welder	Pulsed arc gas metal welding machines to perform automatic semi-automatic welding.	Industrial engineering surveys and observations indicate a 40-percent staff-hour savings in comparison to hand-held stick electrode welding techniques. Weld rejection rate decreased 40 percent using this equipment.
Consolidated Pipe Hanger Facility	Computer controlled robotic center to manufacture pipe hangers.	Current production indicates 50-percent staff-hour savings.
Flexible Machining System	System consist of 2 numerically controlled machines, tools, automated pallet system, and inspection probes to manufacture gearbox housings and horns.	A reduction in labor requirements, improved manufacturing methods and techniques, and reduced inventory due to reduced flow times.
Wang VS-85 Word Processing System	Wang system used to generate, maintain, and computerize all assembly work instructions for production.	Equipment estimated to save \$166,320 per year based on reduced time necessary for maintenance of factory planning documentation and entry of data into shop floor control system as compared to manual methods.

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Distributed Numerical Control and Machine Tool Management System	Phases 4 and 5 of a 5 phase program to incorporate a total of 73 numerically controlled and 100 conventional machine work stations.	At full implementation, expect to achieve 22.7-percent productivity improvement. Savings estimated at over \$5.7 million per year on 73 numerical machines and \$2.2 million on 100 conventional machines.
Drainage Maintenance	Installation of a storm drainage system to redirect storm drainage from solid waste disposal area.	Extension of drainage system allows for continued use of solid waste area that would otherwise have to be deposited elsewhere at an estimated cost of \$512,000 per year.
Gould Sel32/8780 Digital Computer	New digital computer to replace and upgrade an obsolete and unreliable computer system for simulations development.	Savings totaling \$257,000 per year with new computer for simulation development, operational setup and checkout, unscheduled downtime, and maintenance costs. Additional savings of \$100,000 estimated to accrue to users.
Computerized Numerical Control Lathe	Replace manual lathe.	Savings of \$215,000 per year from reduced scrap, rework, and labor.
Dual Robot Assembly Cell	Two assembly robots to automate parts assembly, drilling, and riveting of aircraft panels and bulkhead type structures.	Estimated productivity cost savings of over \$534,000 in first year to over \$1,186,000 in year five. Labor reduced by over 17,000 hours.

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Mazak VQC-30/50B Computerized Numerical Control Milling Machine	Replace badly worn milling machine.	Reduce number of mill operators from six to three. Total cost savings of \$237,956 per year from reduced direct labor and machine set up time.
Industrial HMC-2460 Wire Bonder	Automatic wire bonder for microelectronic circuits.	The average standard hours per circuit was reduced from 70.90 hours for manual bonders to 11.14 hours for the automatic wire bonder. Cost avoidance of over 21 operators for two shifts required to do manual bonding. Annual savings of \$398,740.
Material Acquisition Center	Automated storage and retrieval system facility for material management.	Labor savings estimated to equal 32 persons. Total annual savings about \$3 million.
Rollover Conveyor System	Equipment to provide efficient methods to assemble missile sections and subassemblies.	Annual savings of \$140,709 due to improved material flow, better use of labor, and overall improvement in missile assembly.
Office Building and Engineering Labs	Additional engineering facilities and general office space to meet current and future requirements.	Co-locates all engi- neering and development activities and will improve communications and interaction between engineering and manu- facturing functions.

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Manufacturing Facility	Requirement for a highly productive consolidated fabrication and assembly facility.	Permits production operation in a proper environment to assure delivery of air vehicles to the armed service.
Parts Paint Conveyorization Facility	Facility eliminates inefficient methods used for priming and topcoat painting of aircraft parts. Conveyor system automates material handling and drying operations, allowing operators to paint continuously.	Projected total savings of over \$23 million for the first 8 years of operations. Estimated economic life of facility is 15 years. Facility designed to include abatement equipment to reduce volatile organic compound emissions to meet latest Environmental Protection Agency Standards.
Sheet Metal Center	Consolidation and modernization of facilities to cut, form, heat treat, and finish aircraft parts.	Projected 20-percent reduction in average number of hours needed to manufacture aircraft.
Computer Image Generation Lab Improvement	Acquired advanced computer graphics technology to enhance high volume production modeling, animation and image interpretation, and analysis programs.	Advanced technology will improve cost competitive position by faster generation of production models.
Dock Receiving and Receiving Inspection Modernization	Equipment to automate product identification, improve mechanical delivery to work stations and upgrade work area.	Average flow time estimated to be reduced by 5 days, and labor reduced by 26 percent. Total estimated savings of \$2,641,691 per year.

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
IBM 3090 Model 200 Computer	IBM 3090 model 200 computer tailored specifically to large data centers emphasizing engineering and scientific applications.	Leased computer has twice the computing capacity of old computer at approxi- mately the same cost and provides for future planned growth. Remov- al of older IBM 3081K computer also saved \$700,000 in indirect cost through the elimination of lease and maintenance costs.
25 Portable Stud Welding Units	Welding units contain a portable power supply and controller to attach strip heaters to steel plates before welding.	Portable welding units are more efficient than the slower shielded- metal-stick-welding- process. The portable units reduced the num- ber of welds done with the stick process by 42 percent which generated significant savings.
Horizontal Boring	Five-inch boring machine which replaces 18-year old Bullard horizontal boring mill.	Provided capability to accomplish work that would otherwise be sub- contracted out.
Computerized Numerical Control Mills	Replace obsolete con- ventional mills with computer numerically controlled mills.	Machine performance demonstrated a 46-percent improvement in methods improvements which represents an increase in productive operating time and a decrease in machine downtime.

<u>Capital asset purchased or leased</u>	<u>Description of capital asset purchased or leased</u>	<u>Contractor's expected benefits</u>
Computerized Numerical Control Machining Centers and Lathes	Factory modernization with computer numerical control machining centers and lathes. Reduces labor, scrap, downtime and mainte- nance, and repair of existing machines.	Factory equipment modernization produced \$6.7 million in savings--\$4.9 million in labor and \$1.8 in scrap/downtime, and repair.
Weapon System Checkout Facility	Construction of modern computerized multi- channel facility to checkout various systems.	Facility runs checks on 4 aircraft's 10 systems simultaneously. Re- duced labor and staff requirements for check- out of aircraft systems by 80 percent. Con- tractor estimates \$1 billion in avoided costs.

REQUEST LETTERS

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Congress of the United States
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Committee on Appropriations
Washington, DC 20515

September 18, 1986

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Honorable Charles A. Bowsher
 Comptroller General of the United States
 General Accounting Office
 Washington, D.C. 20548

Dear Mr. Bowsher:

The Defense Appropriations Subcommittee, over the past three years has been very interested in the relationship of Cost Accounting Standards and the Department of Defense's budget request and contractor profit.

This year, during our hearings relating to the Defense Department's procurement policies and practices the issue of Cost Accounting Standard 414 (CAS 414) was discussed at some length. The testimony on CAS 414 surprisingly revealed that "The Navy is the only Service which specifically identified budget reductions due to cost of money funding levels."

Because of the uncertainty surrounding the cost of money funding levels in the Army and Air Force I am requesting that your office initiate a study to determine how much money has been requested for CAS 414 over the past three years along with the amount included in the fiscal year 1988 request. Additionally, a determination should be made as to whether CAS 414 is accomplishing its objective of inducing contractor investments in cost reducing facilities in both the Departments of the Army and Air Force. I would also ask your office to assess whether or not the Department of Defense's proposed profit policy changes will save substantial sums of money that would otherwise be spent under the provisions of CAS 414.

The General Accounting Office should be prepared to provide interim briefings to the Committee and a report should be submitted to the Committee prior to finalization of the fiscal year 1988 Defense Appropriations Bill.

Your assistance is greatly appreciated.

Sincerely,

Bill Chappell, Jr.
 Chairman
 Subcommittee on Defense

BARBARA BOXER
6TH DISTRICT CALIFORNIA

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September 26, 1986

Honorable Charles A. Bowsher
Comptroller General of the United States
General Accounting Office
Washington, D.C. 20548

Dear Mr. Bowsher:

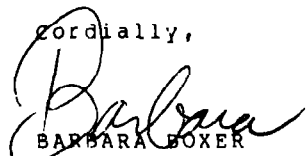
During the past several years, I have expressed concern over the Department of Defense's expenditure of funds to pay contractors for Cost Accounting Standard 414 (CAS 414). I have recently discussed this subject with the Chairman of the Defense Appropriations Subcommittee, Mr. Bill Chappell. He has advised me that he has requested the General Accounting Office to determine the amount of funding associated with CAS 414 in both the Air Force and the Army over the past three years and whether the expenditure of those funds has accomplished the intention of CAS 414, to encourage contractors to invest in capital improvements. This would assist Congress in determining whether CAS 414 is still relevant.

In light of the GAO's finding that DoD policies for increasing capital investment are flawed and have resulted in increased profit for contractors, he has also asked the GAO to determine if the Pentagon's new profit policy would save the billions of dollars that would otherwise be spent as a result of the flawed use of CAS 414.

Because of my interest, I am asking that your office provide me with interim briefings and reports during the course of this review, and, of course, the final report as soon as it is completed.

Your assistance is greatly appreciated.

Cordially,


BARBARA BOXER
Member of Congress

BB:dm

OBJECTIVES, SCOPE, AND METHODOLOGY

This study was requested on September 18, 1986, by the Chairman, Subcommittee on Defense, House Committee on Appropriations because of uncertainties surrounding the cost of money funding levels in the Army and the Air Force. (See app. IV.) The Chairman asked us to determine how much money had been requested for CAS 414 over the past 3 years along with the amounts included in the fiscal year 1988 request. In addition, we were asked to determine whether CAS 414 was accomplishing its objective of inducing contractor investments in cost reducing facilities. The Chairman also asked us to assess whether or not DOD's proposed profit policy changes would save substantial sums of money that would otherwise be spent under the provisions of CAS 414.

On September 26, 1986, we received a letter from Congresswoman Barbara Boxer requesting interim briefings and reports during the course of our review and a copy of the final report. (See app. IV.) In October 1986, we met with the representatives of the Chairman and the Congresswoman to discuss the scope of this assignment. It was agreed that we would:

- (1) Review the treatment of CAS 414 in the budgeting process for the Army, Air Force, and Navy. (The Navy was added because of confusion over whether or not the Navy was negotiating cost of money on its contracts.)
- (2) Identify the amounts of money negotiated by the services for cost of money, profit on facilities capital employed, and total profit by contract.
- (3) Assess the practicality of determining how much money is included in each service's budget request for CAS 414.
- (4) Select a number of contractors to visit and obtain data on CAS 414 funds received and capital investments made, along with descriptions of the capital investments and the productivity enhancing and cost reducing characteristics of the investments.

The Chairman's request for an assessment of whether DOD's revised profit policy will save money was addressed under another review for the Chairman, House Committee on Government Operations.

The representatives decided that our interim briefings to Congresswoman Boxer's representative would serve to satisfy our usual liaison arrangements to report our progress to the requester. At one such briefing, we agreed to include a section

in the report explaining cost of money and the part it plays in the investment decisions of contractors and its relationship to DOD's profit policy.

We obtained from DOD its DD Form 1499 data files for fiscal years 1981-1986. This form is titled "Report of Individual Contract Profit Plan," and identifies the amounts of funds negotiated to reimburse a contractor for cost of money and provide a profit on facilities capital employed. The 1499 files are limited to negotiated contract actions of \$500,000 or more. We analyzed the 1499 data and made tests that we considered necessary to establish the reasonableness of the aggregate data used in computing cost of money and profit on facilities capital employed. But, we did not perform a complete reliability assessment on the data base, including whether all contracts that should have been reported, were actually in the 1499 files. In establishing the reasonableness of the aggregate data, we performed a number of tests to determine if the cost of money and profit objective conformed to DOD policies, specifically whether

- the cost of money was calculated at the rate set by the Treasury for the time period analyzed,
- profit rates for risk fell within the profit rate range set by the DOD policy by type of contract,
- profit rates for facilities capital employed fell within the appropriate profit rate set by DOD policy, and
- profit on estimated cost was reduced by the DOD 30-percent offset.

In order to determine how the services estimate their program costs for cost of money and profit on facilities capital employed and the practicality of identifying these costs in their budget requests, we met with budgeting officials of the Army, Navy, Air Force, and the Office of the Secretary of Defense, and obtained an overview of the procedures and process used by the services and DOD to develop their budget proposals.

To select the contractor segments we visited, we analyzed the 1499 files to determine, by contract, the cost of money and profit on facilities capital negotiated by each service. We then extracted the segments with which the services had negotiated the largest amounts of these funds. We then selected nine segments--three representing each military service--to be visited and interviewed about their capital investments. The following segments were visited:

- General Dynamics Corporation, Electric Boat, Groton, Conn.
- The Boeing Company, Boeing Aerospace, Seattle, Wash.
- Tenneco, Inc., Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
- Grumman Corporation, Grumman Aerospace, Bethpage, N.Y.
- Rockwell International Corporation, North American Aircraft Operations, El Segundo, Calif.
- General Motors Corporation, Hughes Aircraft Company/Missile Systems Group, Canoga Park, Calif.
- Lockheed Corporation, Lockheed Georgia Company, Marietta, Ga.
- United Technologies Corporation, Sikorsky Aircraft Division, Stratford, Conn.
- Martin Marietta Corporation, Martin Marietta Orlando Aerospace, Orlando, Fla.

Our review was performed between November 1986 and May 1987 in accordance with generally accepted government auditing standards.

(396111)

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