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ADDRESS BY

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GENERAL ACCOUNTING OFFICE REVIEWS OF
DEPARTMENT OF DEFENSE PROCUREMENT
IN THE UNITED STATES
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It is a pleasure for me to be here today to talk to you about the audit work of the General Accounting Office relating to procurement. As you can well imagine, this subject represents one of the largest areas of effort by our Office. We assign almost 10 percent of our total staff resources to procurement. A large part of this work is concerned with procurement by the Department of Defense. But major procurement expenditures are also made by the National Aeronautics and Space Administration, the General Services Administration, the Department of Transportation, and many other agencies.

In reviewing defense procurement, GAO makes a distinction between the process of acquiring major defense systems and the process of contracting. Each of these activities is governed by its own set of management concepts and regulations; each is audited from a different perspective.

The management of the acquisition of major weapons systems deals with the difficult problems of properly defining needs; objective analyses of cost and effectiveness of alternative

systems; research, development, performance and testing; and, eventually, production.

In contrast, auditing the contracting process emphasizes such matters as selection of appropriate sources of supply; evaluation of contractors' proposals; contract pricing negotiations, contract administration, and settlement of contract claims; and contract terminations.

I will outline how we plan and perform our reviews in each of these areas.

REVIEWS OF MAJOR WEAPONS SYSTEMS

Currently, the Department of Defense has 147 major weapons systems, estimated to eventually cost more than \$250 billion, in various phases of acquisition, i.e., somewhere between early development and deployment of the system.

GAO's work related to the acquisition process would include:

- Determining if the military services are adequately defining their missions and goals. As a pre-requisite for the acquisition of a major weapons system, a mission need should be formally established and approved by the Secretary of Defense.
- Assessing cost effectiveness analyses of various alternatives leading to the selection of a preferred method of meeting the need.
- Determining whether testing and evaluation of major systems is effectively planned, conducted, reported, and considered in decisionmaking.

--Determining ways to enhance programs designed to promote the North Atlantic Treaty Organization standardization.

--Providing the Congress with information on individual major systems for which funds are being requested.

This last effort accounts for a good portion of GAO's work on major weapons systems. Each year, prior to congressional hearings, we review between 25 and 30 individual weapon systems. Our objective is to provide the Congress with an independent assessment of the status, progress, and problems associated with each acquisition. We know that program advocates from the military services can be counted on to provide the Congress with information on the positive aspects of their programs when they are requesting funding. Therefore, we look for the information on cost growth, technical problems, schedule slippages, performance limitations, and less costly alternatives that the program advocates would not be expected to volunteer to the Congress. Our reports are used extensively in congressional deliberations. We have been highly successful in providing information that permits a more critical examination of important issues by the Armed Services and Appropriations Committees in both houses of the Congress.

The management approach to weapons acquisitions that we favor--based on over 10 years of intensive examination of weapons programs--in brief is to make haste slowly. In the absence of an overriding immediate military requirement,

not often evident in peacetime, experience has shown that total costs are minimized and system performance maximized by a step-by-step approach that recognizes and attempts to resolve any high risk technical problems before going into production. In the United States this is often referred to as the "fly-before-you-buy" concept--the attempt to reduce the concurrent development and production of weapons systems.

We attempt to make our reports objective, balanced, and in proper perspective. It is easy to point out problems pertaining to cost, schedule, and performance--every major development program is plagued by them and we think it is our job to make known these problems. But it is extremely important, however, that we advise the Congress as to the significance of those problems and what we think should be the future course of action.

This is an age of rapid technological change. It is probably nowhere more evident than in the newer major weapons developments. What does this mean in reviewing major acquisitions? Mainly, it means evaluating technical risk.

The auditor must be very much aware of the environment of weapons acquisitions and the management approach taken by the military services. The tendency on the part of U.S. weapons developers during the past 25 years has been to push the state of the art in almost every new system. The

desire is to score a "breakthrough" rather than to accept incremental improvements over existing systems. This leads to a high degree of technical risk--and technical risk is probably the single most significant factor that produces cost growth, schedule slippages, and in many cases, the need to accept less performance than desired.

While one can be critical of an approach that seeks to make quantum jumps in technology--we, as auditors, must also recognize that this approach has produced, for the United States and its allies, weapons that usually are far superior, technologically to those produced by the Soviets. True, they cost more and we have relatively fewer in number, but most are acknowledged to be superior weapons.

From a management standpoint, the Department of Defense is required to identify technological risks and the ramifications on total system performance. The acquisition process for major systems is designed primarily to cope with the technical uncertainties and the consequent cost performance and schedule risks. These management actions are usually documented and are available to GAO.

Our audit technique for this type of work, simply stated, is to analyze as many documents and talk to as many people as possible, and come to conclusions from all information available to us. This information includes intelligence assessments of

enemy threat, concept papers that lead to research programs, contracts, progress reports, cost analyses, test reports, and more. We perform no tests ourselves, nor do we prepare our own cost estimates or cost effectiveness analyses. We do not decide what is needed, or how much. We do evaluate and comment and raise questions on what the military services are proposing or doing. Our staff also is required to keep abreast of political and economic issues in an effort to assess their impact on weapons acquisition decisions.

We have found that business school trained auditors, with a management orientation, can be very effective and can understand complex military and technical problems, given the training and experience available in GAO. We also find that we must employ, either on our staff or as consultants, a variety of engineering and related skills to assist in the more complex evaluations of test and laboratory reports and similar data. We have had no real problem integrating and utilizing the efforts of diverse disciplines in this type of work.

The acquisition process is incremental with defined milestones or decision points for proceeding to each phase. The procedures include general criteria of what is to be accomplished during the various phases and what is to be demonstrated to support the decision to continue the acquisition process. In conjunction with the general policy statements and procedures, each program has a statement of specifics that must be addressed in preparing for the next decision.

GAO auditors use these general and specific criteria in formulating audit objectives and as a basis for evaluation. Each year, for systems in the research and development phase, we concentrate on those issues that will significantly affect decisions made by the military services and the Congress. Let me explain how we do this on a specific audit.

One of the best examples of the nature and scope of our weapons work is the subject of the cruise missile. The cruise missile technology offers some very promising military advantages-- it is relatively accurate, unmanned, and may turn out to be inexpensive in relation to other strategic weapons systems. With the decision by President Carter to discontinue development of the B-1 bomber, it became clear that the military needed a long-range cruise missile. We have, however, seriously questioned the continued development of cruise missiles to be used for tactical purposes--ground-to-ground employment by the Army or submarine-to-shore by the Navy, for example. This was on the grounds that there were many other effective alternatives already deployed. On the technological side, we have been looking very closely at the cost and feasibility of developing good data for the onboard computer guidance system--the most critical development issue.

Another example of our work pertains to the proposed MX missile system. This system is in an early phase of the acquisition process and, consequently, one of the main issues was

whether risk--technical and cost--would be demonstrated to be acceptable before proceeding into full-scale development. Specific risk areas had been identified and results in these areas were to be considered at the decision point. From records, we were able to determine that satisfactory progress was being made in the technical risk areas and that while there were problems, alternative solutions were being explored and looked promising. Our examination showed also that validation of cost estimates for constructing buried tunnels--one of the proposed basing concepts for MX--had been delayed. Consequently, some important information in a critical cost risk area would not be available by the planned decision date. We reported those facts to the Congress--something the Department of Defense had not done.

As you may surmise from this narration, auditing of a major acquisition does not differ greatly from auditing other activities. The basics--planning the audit, determining objectives, establishing criteria, gathering evidence, analyses to identify deficiencies, and their causes--must occur whether we are examining a major weapon acquisition or performing a financial audit.

The size and dynamics of major acquisitions affect our audits. Because of the magnitude of one of these programs and time constraints, we cannot examine every aspect of the acquisition. We must be selective and direct our resources toward areas believed to be most important to the Congress.

Acceptance of many of the recommendations we have made over the years is one measure of our success. The attention given our reports, not only by the Congress but also by the Department of Defense, is another.

A large part of our success can be attributed to the professional staff that GAO has assigned for this purpose. Their experience in combination with the auditing expertise we expect from all our auditors has demonstrated that major acquisitions--with all their complexity--can be audited.

Let us turn now to the other aspect of defense procurement--the contracting process.

SIGNIFICANCE OF GOVERNMENT DEFENSE
PROCUREMENT

Total military procurement for fiscal year 1977 amounted to almost \$50 billion. Reliable data on nondefense procurements is not available but it probably approximates, in total, defense procurement.

Looking at the available 1977 Defense Department procurement data provides some interesting information.

<u>Extent of competition</u>	<u>Number of actions</u>	<u>Amount</u> (billions)	<u>Percent</u>
Formally advertised	648,000	\$ 3.9	8
Other price competitive	2,916,000	9.3	19
Nonprice competitive	<u>5,982,000</u>	<u>36.1</u>	<u>73</u>
Total	<u>9,546,000</u>	<u>\$49.3</u>	<u>100</u>

Formally advertised contracts account for less than 10 percent of the defense procurement dollars. By allowing any responsible contractor an opportunity to bid, this method offers the greatest assurance of the integrity of the U.S. Government in its spending of public funds. The major advantage of advertised procurement as well as other forms of price competitive procurement of course is that the Government usually can save an estimated 20 to 25 percent of the cost of a similar item purchased noncompetitively.

However, as weapons systems and related procurements have become more and more complex, it has become increasingly difficult to use the advertised method. For example, a prerequisite for this is to have a complete, explicit, and realistic specification or purchase description upon which there can be competitive bidding for the provision of identical materials or services. Specifications must be available to

all potential bidders and not restricted because of security classification of information. Obviously, few of the complex needs of the Defense Department can meet this requirement. Thus, most of the weapons systems are obtained through negotiated procurement. Unfortunately, the major portion of these procurements are made without price competition.

The great preponderance of noncompetitive procurements leads to two problems of primary concern to GAO

- How to ensure, in the absence of effective competition, that the price is reasonable.
- Because profits are usually negotiated at a percentage of cost, large defense contractors have little or no motivation to improve production efficiency and reduce costs. It is widely recognized that current methods of negotiating contracts actually provide an incentive for contractors to keep costs high.

Because of these inherent problems, GAO concentrates on contract audits that are designed to:

- Evaluate how well Defense Department negotiators and auditors protect the Government's interests in negotiating reasonable prices. We audit a small number of contracts each year to ascertain whether current, accurate, and complete cost data was used in the negotiation process.

--Determine ways to motivate contractors to reduce costs. Such reviews deal with contractor investment/profit policies; production efficiencies (should cost); reasonableness of overhead allocations, and the like.

I will now discuss some of the more significant areas we cover in our procurement reviews.

Contract pricing reviews

Since a very large portion of the total amount of Government expenditures is involved in negotiated contracts, we expend considerable audit effort in this area. The fact that over 70 percent of the dollar value of defense procurement is placed without price competition makes it extremely important that adequate procedures be followed in the pricing of such contracts. In our past reviews, we found that the Government was frequently at a substantial disadvantage in negotiating contract prices because it did not have the latest contractor cost and pricing information. Our reports during this period contributed to enactment of a law known as the Truth in Negotiations Act of 1962. Under the act, for most noncompetitive contracts and subcontracts exceeding \$100,000, contractors are required to submit cost or pricing data and certify that it is accurate, complete, and current.

In most cases, the cost data submitted is audited at the contractors' plants by the Defense Department's Contract Audit Agency, and the auditors information is used by the Government contracting officers in negotiating contract prices. If it is later found that the contractor's cost or pricing data was inaccurate, incomplete, or noncurrent, the Government has the right to adjust the price to eliminate any overpricing that resulted.

We recognize contracting officers' responsibility to conduct contract negotiations. We do not become involved in pricing reviews until after contracts have been awarded. While there has been considerable improvement in the pricing of Defense contracts over the years, there still is considerable room for improvement. Last year we audited 28 contracts and subcontracts valued at about \$400 million. We identified \$22 million that could not be supported by cost or pricing data available during negotiations. We attributed this apparent overpricing to:

- Contractors and subcontractors submitting inaccurate, incomplete, or noncurrent data.
- Prime contractors inadequately evaluating subcontractor proposals.
- Government personnel inadequately evaluating prime contractor proposals.

INCREASING PRODUCTIVITY OF
DEFENSE CONTRACTORS

We are interested in any steps that would increase the productivity and reduce costs of defense contractors. A number of projects are underway in this area. I will mention a few of the more important ones.

1. Profit policy

Until about 18 months ago, profit objectives were established by Defense contract negotiators based upon estimated costs to be incurred in contract performance. Thus, as I mentioned earlier, the higher the projected costs, the higher the contractors' profits. The adverse effects of this policy were pointed out in a 1971 GAO report on defense industry profits. In that report, we recommended that emphasis be redirected to computing the profit objectives primarily on the basis of providing a reasonable return on contractor capital required for contract performance rather than on costs to be incurred.

Little progress was made until the Department of Defense completed a similar profit study in 1976 and came to the same conclusion. Then, the Department revised its method of developing contract profit objectives to consider contractor capital requirements. A major portion of the profit objective is still based on costs, however, this may minimize the hoped-for incentive to reduce costs through

consideration of return on capital employed. The new procedures have been in effect for a little more than a year, and we are in the process of evaluating them.

2. Value engineering

In 1963 the Secretary of Defense established a value engineering program. The basic objective is to stimulate contractors to propose design and/or production changes and to share any cost-savings generated.

During a recent review of the program, we found that savings have declined sharply since 1971, and the program has fallen far short of its potential. A few weapons systems have produced significant savings but many have shown no savings. It may be that the anticipated benefits to the contractors are not high enough to motivate them to make cost-saving changes.

3. Manufacturing technology

In the early 1950s, the Air Force began a program to reduce the manufacturing and life cycle costs of Air Force materiel. Probably, the best known result was the development of numerically controlled machines. The manufacture and use of these machines is now a worldwide industry. In another case, platinum cobalt was being imported from Russia for use in manufacturing tubes used in electronic countermeasure equipment. A domestic material substitute was developed that not only reduced costs and leadtimes, but resulted in a greatly improved equipment capability.

The program has been expanded to all military services, and there are about 600 projects in progress at any one time involving almost every commodity the Department of Defense buys. Currently, funding amounts to about \$100 million per year and is expected to rise to about \$200 million by 1981.

We are planning to review this program to determine how successful it has been in achieving its goals and whether there may be further avenues which should be explored. The ultimate test of the program is to determine if the Government is obtaining significant benefits from improved technology or management systems in the form of reduced contract prices and, if so, are these benefits greater than the cost involved.

4. Should cost reviews

In this type of audit, emphasis is placed primarily on the study of the efficiency and effectiveness of contractors' production operations. They, also, frequently lead to identification of Government contracting and administration practices that adversely affect contract costs. We began work in this area in 1970 and have issued several reports since. Our most recent report dealt with ways to increase U.S. shipbuilding productivity. Currently, we have an assignment underway with the objective of evaluating the effectiveness of the Department of Defense's should cost program.

5. Work measurement system

The productivity growth rate in the United States has been declining for 12 years while costs of new weapons systems have been increasing. This concern resulted in many Air Force and GAO studies which concluded that opportunities existed for reducing direct manufacturing labor costs of major weapon systems by the improvement and increased use of work measurement systems by contractors.

Almost universally, studies have found relatively low levels of manufacturing efficiency in major aerospace contractor plants. The findings are that typically about 40 percent of total direct charges on a production contract are for manufacturing labor and that as much as half of this labor is nonproductive because of various inefficiencies.

An Air Force review of practices in private industry disclosed that the adoption of a disciplined work measurement system improved productivity substantially. As a result, the Air Force has developed a procedure and incorporated it in selected production contracts that specifies minimum requirements that must be met for a contractor's work measurement system to be considered acceptable.

We plan work at the contractors' plants to determine if benefits are being realized.

SHIPBUILDING CLAIMS

At present, the U.S. Navy has unsettled claims from shipbuilders totaling almost \$3 billion. This has been a

worsening situation for a number of years. As early as 1972 we reported to the Congress on the causes of shipbuilders' claims and urged action to correct the problem. Obviously, insufficient action has been taken.

There is no doubt that the blame for the claims rests with both the Navy and the shipbuilders. Problems we have identified and reported on include:

--Late and inaccurate lead-yard working plans.

(Under many Navy programs, one shipbuilder is selected to build the first ship of the class and then that shipbuilder is required to provide its detailed working plans and drawings to the other shipbuilders in the program.)

--Inadequate Navy specifications and guidance drawings outlining the characteristics of the ships that the contractors are to build.

--Defective, and late delivery of, Government-furnished equipment and technical information.

--Indiscriminate use of Navy verbal orders to the contractors to make changes in construction plans, techniques, or materials.

--Difficulties of the contractors in maintaining an adequate work force.

--Inefficient contractor production processes.

Generally, claims resolved by the Navy on the basis of Government responsibility have been settled for 40 to 50 cents on each dollar claimed. Many shipbuilders are unhappy with settlements in this range and may pursue their claims in the courts.

The General Accounting Office will, in the near future, begin a major review of the entire ship acquisition process in an attempt to develop recommendations that will avoid, if possible, a repetition of the confrontation we now have between the Government and the shipbuilders.

I would like to mention, just briefly, several other areas of interest--cost accounting standards, patent policies, and the major study of U.S. Government procurement that was completed several years ago.

Cost accounting standards

Several studies conducted in the late 1960s indicated that individual companies' accounting practices were not always consistent between accounting periods and did not always treat Government and commercial customers equally. In response to these studies, the Cost Accounting Standards Board was created by our Congress in 1970, empowered to establish accounting standards for major contractors dealing with the Government.

The purpose of cost accounting standards is to achieve uniformity and consistency in estimating, accumulating, and reporting costs in connection with the pricing and settlement

of larger negotiated prime contracts and subcontracts. Contracts are excluded where (1) the price is based on established catalog or market prices of commercial items sold in substantial quantities to the general public or (2) prices are set by law or regulation.

Cost accounting standards are not intended to prescribe uniform accounting practices for all contractors. Rather, the purpose is to ensure consistent, uniform and equitable accounting practices by each individual contractor.

Some of the adopted standards include:

- Allocation of costs in a consistent manner in estimating, accumulating, and reporting costs (401).
- Allocating costs as either direct or indirect if incurred for the same purpose in like circumstances (402).
- Allocating home office/group expenses to segments (403).
- Capitalization of tangible assets (404) and 11 additional standards.

Standards under study include: insurance (416), distinguishing between direct and indirect costs (417), and at least four others.

Patent policy

Today we do not have a uniform system for management, protection, and utilization of the results of Government-sponsored scientific and technological research and development. U.S. patent policy has developed primarily on an agency-by-agency basis. Presidential policy statements have been

issued periodically to try to bring greater consistency in agency practices--most recently by President Kennedy in 1963 and President Nixon in 1971.

Nevertheless, the belief persists that the Congress should establish a consistent Government-wide position so that the researcher could be confident his rights were protected and inventive pursuits were not deterred by arbitrary actions. In 1976 I testified before a Committee of our House of Representatives to that effect. I stated that, for inventions derived from Government-funded research and development through contracts or grants, the Government should retain title to the patents; however, the general policy should encourage exclusive licensing to private enterprise for commercial purpose with four provisions:

- The Government must retain control to safeguard national security and assure public protection against hazards.
- The Government should be assured of royalty-free use of all patent developments.
- The Government should have recovery rights so the license can be assigned elsewhere if the contractor is not diligent in pursuing commercial development.
- To avoid unfair monopolistic advantage, the contractor can be required to license competitors at a reasonable royalty rate.

Legislation to establish a uniform patent policy for Federal agencies to follow in allocating patent rights was introduced in the House of Representatives last year, but no action has been taken yet.

Federal Procurement Commission

Several years ago a study group, the Commission on Government Procurement, was formed to look at the entire subject of Federal Government procurement.

The Commission's recommendations are beginning to have a major impact on procurement operations. For example, under a new Government policy, major weapon acquisitions may begin only after establishing that a defense mission need exists. Another requirement is that the weapon system evolves successfully from a competition design process which allows for hardware demonstration of the best solution.

The Commission also called for a unified, modern statutory base to replace the multiplicity of laws and regulations now governing Department of Defense and other agency procurement.

As a result of the Commission's report, the Congress set up a new procurement office within the executive office of the President to provide leadership, to set policy, and to coordinate the many reforms now taking place. In addition to the ones I've already mentioned, the Commission recommendations would

- limit use of Federal specifications, particularly where commercial products can be bought off the shelf competitively;
- clarify our policy as to when we should buy goods and services from the private sector rather than the Government "doing for itself";
- set up a Federal institute to strengthen career development, training, and research in the procurement field; and

--provide alternative forums for settling contract disputes between a Government agency and a private firm.

It is because of the large amounts involved in U.S. defense procurement and the potential for savings, that the General Accounting Office plans to continue to apply about 10 percent of its available staff resources in this area. The costs of defense systems are high. The need for a strong national defense is overriding. There are no easy solutions. The challenge to GAO is to make constructive recommendations that will bring about lower costs without an adverse affect on the military's ability to deploy effective weapon systems.

VALUE ENGINEERING PROFILE

The concept of value engineering is largely a by-product of material shortages during World War II. These shortages led to the creation of innovative material and design alternatives and it was found, in many cases, that the alternate approaches functioned well, or better, and cost less. From this beginning, an analytical discipline later evolved in private industry which was structured to challenge the proposed way of doing things and systematically search for less costly alternatives. Commonly known as value engineering, it is sometimes termed value analysis, value control, value improvement, or value management.

Value engineering involves a systematic analysis of each function to be performed by an item with the objective of achieving the function at the lowest overall cost consistent with performance, reliability, quality, and maintainability requirements. In essence, the prevailing viewpoint of value engineering analysis is that while anything providing less than the essential functional capability is unacceptable, anything providing more is unnecessary and wasteful and should be eliminated or modified. Those features or characteristics of an item which exceed actual needs and contribute nothing to essential functional capability are often called "gold plating."

Although the program is also applicable to other Defense agencies, we concentrated our review on the three military services since they make most of total Defense procurement, and the effectiveness of the program is largely dependent upon what they do. To illustrate, about 99 percent of Defense's fiscal years 1975 and 1976 total procurement obligation authority was for Army, Navy, and Air Force procurement, and over 97 percent of the total value engineering program savings reported in the past 6 years was produced by the services.

The attention given to the military services, however, should not be taken as an indication that we believe important savings opportunities do not exist or should not be pursued in other Defense agencies. We also recognize that there probably is good potential for value engineering savings on many smaller procurement programs.

We interviewed the Department of Defense, Army, Navy, and Air Force Headquarters officials and reviewed documents, records, and reports related to the Defense value engineering program for contractors. We also participated in a value engineering Congress sponsored by the Air Force Systems Command at Andrews Air Force Base early this year. Here, representatives of 20 major defense contractors and Air Force and other agency representatives conferred in a 2-day workshop to identify the problems impeding the value engineering program for contractors and to jointly develop recommended solutions.

SHOULD COST REVIEWS

Our work at several shipyards produced money-saving ideas. Some specific examples are:

We suggested that one shipyard consider acquiring a new frame bender. A frame bender is a large machine used to roll the steel structure that forms the ribs of a ship's hull. Management said that our suggestion had been adopted--the machine was purchased and was being installed. By having its own frame bender, the company will not be as dependent upon suppliers and will reduce the risk of costly schedule interruption. The shipyard managers estimated a 14-percent return on the investment.

At another shipyard we suggested that an area adjacent to the end of the graving dock (a dock that can be kept dry for use during ship-building) be used to construct, assemble, and outfit the deckhouse portion of ships. The deckhouse is being built in the location suggested in two sections and completely outfitted on the ground. Each section is then lifted onto the ship where final installation is completed. This suggestion has reduced the overall construction and outfitting time for the deckhouse and facilitates the planning and use of labor.

One shipyard promptly adopted our suggestion to interview employees as they leave (make exit interviews) to identify the reasons for labor turnover and to initiate actions to reduce these costs. The labor turnover rate later declined.

Our suggestions at two shipyards to consolidate fragmented maintenance material storage areas to provide for effective management planning and for control of maintenance personnel and material resources have been agreed to by management at both shipyards.

MANUFACTURING TECHNOLOGY

GAO is conducting a survey of this program within the Department of Defense. In connection with this survey we will analyze the expenditures in the Defense budget to determine how much money is being applied to the program.

We will interview both Defense and contractor officials responsible for the managing and implementing of this program in order to determine how the funds are being applied.

This survey is to determine whether we should conduct a full audit of this program. The next step would be to develop an audit program to evaluate the program management effectiveness.

Some examples of manufacturing technology are as follows:

One example of a successful manufacturing technology project is the production of jet engine turbine disks by a new process called Hot Isostatic Pressing. This involves the hot pressing of superalloy metal powder into the required shapes with very little expensive machining needed. Using this process to manufacture nine parts of one type of jet engine is estimated to save over \$90 million for 4,500 engines.

Another manufacturing technology project which is a state of the art advancement is the welding of thick metal plates by continuous wave laser welding.

A project that is now being implemented on our F-111 aircraft is an improved manufacturing process for production of an infrared detection device. This process resulted in a cost savings of 30 percent.

DEPARTMENT OF DEFENSE PROFIT POLICY

Our primary objective was to determine whether DOD's new profit policy is achieving desired results to motivate defense contractors to make investments which will increase productivity and reduce contract costs. We also wanted to determine whether DOD's new policy was resulting in increased profits to contractors contrary to DOD's proclaimed intentions that overall profits will not be increased.

We selected and analyzed 30 Navy negotiated contract actions over \$500,000 each where the weighted guidelines were used to establish a prenegotiation profit objective. Fifteen of these contracts were negotiated before and 15 were negotiated after the effective date of the new profit policy, with each pair of contracts involving the acquisition of the same or similar items.

We spoke with responsible Navy officials at the Naval Air Systems Command and Naval Sea Systems Command at Crystal City, Virginia.

We reviewed DOD regulations and Navy contract files, and also sent letters to contractors to obtain capital investment information.