BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Secretary Of Defense

DOD's Industrial Modernization Incentives Program: An Evolving Program Needing Policy And Management Improvement

The DOD Industrial Modernization Incentives Program provides incentives to contractors for investing in efficient manufacturing equipment and processes--a way to reduce cost of weapon systems. DOD officials estimate that the program will reduce costs by over $6 billion in the next 8 to 10 years. A test of the program began in 1982 to assess approaches for carrying out program objectives and to develop program policy and guidance.

Early results show that the program has the potential for reducing acquisition costs and providing additional benefits. Draft policy and guidance has been developed that adequately discusses several important aspects of the program.However, DOD needs to establish an improved cost and benefit reporting system, further evaluate the effects of the numerous approaches being used, and strengthen the program planning process. GAO recommends actions to address these needs; DOD concurs with the recommendations.

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-219548

The Honorable Caspar W. Weinberger
The Secretary of Defense

Dear Mr. Secretary:

We reviewed the adequacy of the Department of Defense's (DOD) Industrial Modernization Incentives Program (IMIP) test and the resulting draft guidance. Through IMIP, DOD provides contractors incentives for investing in capital equipment and manufacturing processes. Program objectives are to lower costs of weapon systems and to improve the industrial base. The program addresses two conditions cited as reducing contractors' willingness to modernize: profits based on costs incurred and unstable weapon system requirements. Both conditions are believed to increase the risk that contractors will not achieve an acceptable return on investment. The two primary incentives to contractors are (1) payments based on actual price reductions and (2) investment protection guarantees if affected weapon systems are terminated.

The IMIP approach began in 1978 with one Air Force contractor. In 1982, the Deputy Secretary of Defense established a steering group to direct and monitor a test of IMIP and develop program policy and guidance based on an assessment of the services' experience. In early 1985, 94 contractors were participating in 50 ongoing IMIP efforts. However, most efforts are in the early phases and few benefits have been achieved. Draft policy and guidance were released for comment in November 1984. The IMIP test is scheduled to end in a few months.

In assessing the adequacy of the test and the incorporation of the test results into DOD policy and guidance, we focused on the Air Force's program structure and management. The Air Force has the longest experience and has 33 IMIP efforts involving 77 of the 94 participating contractors.

Our review showed that:

--Potential IMIP benefits to the government are substantial, but the visibility of and accountability for benefits need to be strengthened.

--Though the steering group developed draft policy and guidance that adequately discuss some management issues, improved guidance should be developed through further analysis and testing of approaches.

--Structured planning and programming systems need further development to help the services maximize program benefits.

The following pages highlight and appendix I details our concerns and the improvements that can be made.

POTENTIAL BENEFITS SUBSTANTIAL BUT VISIBILITY AND ACCOUNTABILITY ARE NEEDED

DOD estimates that ongoing IMIP efforts for which benefits have been quantified will reduce DOD's procurement costs by about $6 billion over the next 8 to 10 years. Other benefits, such as improved product quality and reduced lead times, are also expected. Certain conditions, however, make the amount of benefits to be achieved uncertain at this time. Over $5 billion of the estimated cost reductions[1] are based on projections made in the early phases of IMIP and are subject to change. Furthermore, projected benefits are reported inconsistently and may not provide an accurate overview. The Office of the Secretary of Defense (OSD) and its components have not developed guidance on how and when weapon system program offices should incorporate IMIP cost reductions into their budgets and program cost estimates to formally account for benefits.

Few IMIP efforts have reached the final phase where benefits begin to be achieved. An IMIP effort normally has three phases--a factory-wide analysis (Phase I), engineering application technology projects (Phase II), and equipment installation (Phase III). Estimates of benefits in the early phases have varied substantially from those made as efforts enter Phase III. For example, as the Rockwell International IMIP effort for the B-1B program approached Phase III, the estimated benefits declined 90 percent from $400 million in June 1983 to $25 million in March 1985. Although more than $1 billion in cost reductions is estimated from efforts in Phase III, most efforts are in Phases I or II; therefore, most of the $6 billion projected cost reductions are based on projected results from projected investments.

Monitoring and oversight of IMIP are hampered without a uniform system for reporting actual and projected benefits. The

[1]Throughout this letter, the term "cost reduction" refers to both cost reductions and avoidances.

$6 billion in projected cost reductions is based on estimates from individual IMIP efforts which are reported inconsistently and, therefore, are not comparable. In addition, reports on projected benefits do not show the estimated DOD procurement expenditures on which the estimates are based.

Reported benefits may be

--projections of either gross cost reductions or net reductions (which deduct DOD costs),

--a combination of achieved and projected cost reductions,

--projections in then-year or constant dollars[2], and/or

--projections for only selected weapon system programs affected or for all affected programs.

Reporting only gross benefits inflates actual DOD benefits as does reporting in then-year dollars, while not including benefits for all affected systems understates benefits. For example, benefits from the General Dynamics F-16 IMIP effort are often cited as $519 million through 1991. These benefits are estimated reductions based on projected DOD procurement of 2,219 aircraft at a cost of about $40 billion. These benefits are also gross cost reductions not reflecting the $53.1 million in direct DOD funding and incentive payments. Both the costs and benefits are in then-year, undiscounted dollars--not adjusted for inflation or reflecting the greater value of the DOD funds provided in the initial phases versus the value of benefits in later years. The reported benefits are also a combination of achieved and projected savings.

IMIP effectiveness can best be measured through changes in the costs of weapon systems. Neither OSD nor the services have developed guidance for how and when weapon system program offices should incorporate projected IMIP benefits into their budgets and cost estimates. Weapon system offices are currently treating IMIP benefits inconsistently. For example, when efforts enter Phase III, some offices formally document the effect of the cost reductions on their weapon system program while others do not. A major reason cited by Air Force officials for not incorporating IMIP projections into weapon system cost estimates is that projected benefits can change substantially prior to actual contractor investment. Weapon system

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[2]Then-year dollars are based on projected inflation rates for the years in which benefits will be achieved; thus, if a 5-percent inflation rate is projected, $1 in the first year is $1.05 the following year. Constant dollar projections eliminate the effect of inflation.

program offices do not want to commit themselves to optimistic projections. However, not including benefits can obscure program effects.

Conclusions, recommendations, and agency comments

We believe that IMIP has demonstrated the potential for reducing DOD acquisition costs and providing additional benefits. DOD, however, needs improved data on realized and projected benefits and costs to establish program cost-effectiveness. Visibility and accountability will continue to be hampered unless benefits are reported consistently and guidance is developed on how to incorporate projected benefits into budgets and cost estimates. We recommend, therefore, that the Secretary of Defense:

--Establish an IMIP reporting system that, as a minimum, collects data in both discounted and then-year dollars on gross benefits and government costs.

--Develop guidance specifying how and when IMIP benefit projections should be included in weapon system program cost estimates and budgets.

DOD concurred with our findings and recommendations in a letter dated July 26, 1985 (see appendix III). DOD stated changes have been made in draft policy to strengthen visibility of benefits and ensure consistency in reporting. DOD is planning to develop guidance on how benefits are to be identified and tracked and how adequate correlation between benefits and future prices and weapon system program budgets are to be maintained.

DRAFT IMIP POLICY AND GUIDANCE CAN BE IMPROVED

The IMIP test provided an opportunity to refine and assess various approaches to carrying out the program. The Deputy Secretary of Defense assigned the steering group responsibility to develop program policy and guidance based on its evaluation of the approaches used. In December 1984, draft guidance--changes to the Federal Acquisition Regulations, a DOD directive, and an IMIP guide--was released for comment.

The draft guidance addressed several areas in depth such as benefits tracking requirements and management responsibilities. The draft guidance does not, however, adequately address other significant areas because the test was not structured to examine the effects of many of the different approaches used. DOD has the opportunity to improve the guidance by addressing these questions:

--When and to what degree is direct funding in the government's best interest?

--What business arrangements between DOD and the contractors can best meet program objectives and minimize government costs?

--What are the best incentive mechanisms for use with subcontractors and vendors?

Direct funding needs further assessment

The services used very different practices in providing funding for the initial two phases of IMIP efforts, but little analysis was devoted to the effects of these practices. The draft guidance states that contractors should be encouraged to conduct IMIP efforts without direct or indirect funding and that direct funding should occur only when in the government's best interests. All three services, however, have provided direct or indirect funding. Direct funding is provided by DOD to contractors for specific IMIP tasks. Indirect funding is obtained by contractors through charges to overhead accounts of ongoing production programs or offsets in subsequent IMIP incentive payments. Further, no guidance exists to aid the services in determining the conditions under which direct funding is appropriate.

The Air Force provided over $260 million in direct funding to contractors for the initial phases of IMIP efforts from fiscal 1978 through 1984, the latest data available. Air Force officials believe that providing direct funding results in increased contractors' investments and attains a higher degree of modernization. Officials also believe that benefits other than cost reductions are more likely to be realized.

The Navy has rarely provided direct funding, but plans to request $2 million in fiscal 1987 for funding of Phase I efforts for small businesses. However, contractors participating in Navy IMIP efforts can obtain indirect funding for costs incurred. Navy officials believe they obtain the same benefits cited by Air Force officials without having the amount of program funding as a constraint.

Funding practices, in addition to differing by services, also differ based on whether a prime contractor, subcontractor, or vendor is involved. Both Air Force and Navy officials believe that direct funding of Phase I at subcontractors and vendors may be more necessary than at prime contractors. This belief is based, in part, on a limited Air Force review of 19 subcontractors and vendors in one IMIP effort. Results indicated that direct funding for Phase I tended to produce more timely, more thorough, and higher quality factory analyses.

Guidance on business arrangements needs improvement

Business arrangements--the terms and conditions negotiated between DOD and the contractor for carrying out an IMIP effort--are complex and vary considerably among efforts. One reason for the complexity is the variety of available options. During the IMIP test, the services were encouraged to develop different approaches. The steering group, however, did not evaluate many of the effects of these approaches on the program's costs and benefits. While the draft guidance generally describes some options, it does not provide an adequate framework for selecting the most appropriate options under differing circumstances.

An area in which the steering group sought uniformity was a standard discounted cash flow model. Models are used to (1) project the effect of an investment on the contractor's future finances, (2) help determine the appropriate amount of incentives, and (3) provide information on projected government benefits. Because of the method used in the standard model, the results of the financial analysis can be inaccurate or inadequate. Using the results of such analysis can result in an incorrect amount of incentives being provided to the contractor. Further, the model states government benefits in then-year, not discounted, dollars which distorts analysis of an investment from the government's perspective. These problems can be resolved with minimal modification to the model.

Differences in the business arrangements affect the cost, benefits, and risk of IMIP efforts. Areas that appear the most controversial and most in need of additional guidance are:

--Lost profits, usually one of the most important factors in the discounted cash flow model for calculating incentive payments, have either been excluded or included for a range of 5 to 10 years in IMIP financial analyses.

--Definitions of risk and treatment of high risk investments vary and affect the cost of the program as well as the risk to the government.

Incentive mechanisms for subcontractors and vendors need further development

The services are proceeding rapidly to involve vendors and subcontractors in IMIP. As of March 1985, 43 subcontractors and vendors were involved. The draft guidance strongly encourages these efforts and describes the administrative structures that can be used. It does not, however, describe the differences and problems in applying IMIP incentives mechanisms

at the subcontractor and vendor level. The services have gained enough experience at this point to recognize that differences are substantial. The differences appear to be greater with subcontractors and vendors that have little direct government business.

Examples of these differences and problems follow:

--Benefits tracking and validation become more complex due to differences in contracting requirements, pricing methods, and number of weapon systems affected.

--Methods for calculating incentive payments differ.

--The system for determining how much incentives should be paid by a weapon system program office is complex and may have unintended consequences.

Conclusions, recommendations, and agency comments

We believe that business arrangements will have to be tailored for each IMIP effort. However, additional clarification of the impact, results, and intent of various options will help to ensure that IMIP achieves maximum benefits at the least cost. We believe that, with further analysis of test results, the steering group can improve the draft policy and guidance. Since a number of approaches were used during the test, a basis for analysis exists. Furthermore, we believe that continual evaluation and oversight will be needed, due to the complexity of the business arrangements and the time between the start of an IMIP effort and actual investment. The program is still evolving and many issues, particularly those related to subcontractor and vendor involvement, are emerging.

We recommend that the Secretary of Defense direct the IMIP steering group to (1) expand the review of experience gained during the test and, to the extent possible, clarify draft policy and guidance and (2) monitor the continuing implementation of IMIP after the test and revise policy and guidance based on these evaluations.

DOD concurred with the findings and recommendation. DOD plans to retain the IMIP steering group to address issues raised in this report and to improve policy guidance.

IMIP NEEDS A STRUCTURED PLANNING AND PROGRAMMING PROCESS

Development of IMIP programming and planning structures has not kept pace with program growth. All DOD components are

planning to continue expansion of the program, but only the Air Force has begun developing a structured planning and programming process. Such a process helps identify areas in DOD's industrial base where problems may arise in meeting future defense requirements.

A planning and programming process helps in making two basic decisions: where IMIP efforts are needed and how funds can best be allocated. It also provides better information on past performance. Using its process, the Air Force has begun to identify production problems in industrial sectors, such as forging, that are conducive to being addressed by IMIP. Air Force funding decisions are also beginning to be affected by their planning process. For example, the planning process was a major factor in developing the fiscal year 1986 budget estimate submission for IMIP.

Compared to the Air Force, the Navy and Army IMIP efforts are smaller, more recent, and primarily involve their largest contractors. As the Army and Navy expand their programs, they will need a system for identifying those targets of opportunity that will achieve the greatest benefits. The Army and the Navy are not currently providing direct funds for IMIP efforts but are paying for the IMIP through indirect funding. However, both Army and Navy officials have requested IMIP funds for fiscal years 1986 and 1987. Instituting a more structured planning process would help ensure that the Army and the Navy are able to direct their efforts at those areas with greatest potential for cost reduction and other benefits.

Conclusion, recommendation, and agency comments

The draft guidance gives DOD components primary responsibility for IMIP planning and programming. OSD, however, has responsibility for helping to ensure that IMIP achieves maximum benefits for DOD.

We recommend, therefore, that the Secretary of Defense review the IMIP planning and programming process in each service to ensure the processes contain adequate structure to assure IMIP efforts are directed to those areas with greatest potential benefits.

DOD concurred with the findings and recommendation. DOD plans to improve the planning and programming process through annual service status reports, development of Defense Guidance, and greater IMIP integration into industrial base analysis efforts.

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This report contains recommendations to you on pages 4, 7, and 8. As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget; the House Committee on Government Operations, Senate Committee on Governmental Affairs, and House and Senate Committees on Appropriations and on Armed Services; and the Secretaries of the Air Force, Navy, and Army.

Sincerely yours,

Frank C. Conahan
Director

Contents

CHARTS

ABBREVIATIONS

ASD	Aeronautical Systems Division
DOD	Department of Defense
ESD	Electronic Systems Division
GAO	General Accounting Office
IMIP	Industrial Modernization Incentives Program
OSD	Office of the Secretary of Defense
TWT	traveling wave tube

DOD'S INDUSTRIAL MODERNIZATION INCENTIVES PROGRAM: AN EVOLVING PROGRAM NEEDING POLICY AND MANAGEMENT IMPROVEMENT

INTRODUCTION

Department of Defense's (DOD) Industrial Modernization Incentives Program (IMIP) is designed to encourage increased contractor investment in efficient production equipment and processes as well as management and other software systems that will result in higher contractor productivity and reduced weapon system acquisition costs. Program objectives also include improving product quality, shortening lead time, reducing life cycle costs, and increasing surge and mobilization capability. The two primary incentives used are (1) payments based on cost reductions[1] and (2) governmental investment protection guarantees if affected weapon programs are terminated prematurely.

IMIP addresses two DOD acquisition conditions which are cited as inhibitors to contractor investments in modern plant equipment. These conditions are

--directly basing profit on costs incurred and

--instability of weapon system programs and uncertainty of incremental annual buys of weapon systems.

DOD officials believe contractors are reluctant to make investments in expensive equipment when profits will be reduced. Uncertainty that a reasonable return on investment can be generated if a weapon system's procurement is reduced or terminated also slows investments.

In November 1982, the Deputy Secretary of Defense approved a test of the IMIP based on recommendations from DOD's Tri-Service Committee for Improving Industrial Productivity. The purpose of the test is to determine the appropriateness of various approaches to accomplish program objectives. The charter authorizing the test established a steering group composed of officials from the services, the Defense Logistics Agency, and the Office of the Secretary of Defense (OSD). The steering group was responsible for monitoring the conduct and results of the test program and evaluating the success of the various incentives and overall program. The charter gave the

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[1]Throughout this appendix, the term "cost reduction" refers to both cost reductions and avoidances.

services authority to pursue a variety of approaches to carry out the intent of IMIP. Based on its evaluation of the services' experience, the steering group was to develop IMIP policy and guidance and recommend specific changes to the Federal Acquisition Regulations.

The Air Force Technology Modernization Program, a forerunner of IMIP, began in 1978 with the General Dynamics Corporation F-16 production program. In early 1985, the Air Force had 33 IMIP efforts involving 77 contractors and affecting many of its major weapon systems. The Navy did not begin its IMIP until 1983, after the start of the IMIP test. By early 1985, the Navy program included 14 contractors.

The Army's version, the Industrial Productivity Improvement Program, started in 1981. The Army ceased sponsoring the program in 1984, before its contractors had purchased equipment. The Army believed other incentives could address problems of lagging contractor productivity and under-investment. In early 1985, the Army instituted a revised and redirected IMIP under guidelines set by its Under Secretary, resumed discussions with three contractors, and solicited proposals from all of its contractors.

The IMIP process

An IMIP effort can be initiated in a number of ways ranging from a requirement in a weapon systems' request for proposal to an unsolicited proposal from a contractor. Once initiated, an IMIP effort is normally accomplished in three phases. An IMIP effort can be in more than one phase at the same time. The following chart shows the IMIP phases.

IMIP Phases

Phase	Contractor actions	Results
I	Top down factory or product line analysis	Proposal for Phase II and/or III
II	Develop and validate engineering applications of new technology	Capital investment proposal
III	Investment in and installation of capital equipment	Cost reductions, other benefits, and incentive payments

Phase I is a structured analysis of the contractor's factory operation. It results in a plan to modernize the entire facility or a single product line by identifying contractor projects to be developed and integrated into the factory. DOD may directly fund the Phase I analysis. The plan identifies those investments which will result in cost reduction but are not projected to give the contractor an adequate return on investment.

Phase II entails the design, development, and validation of the new manufacturing system. New technology or equipment can be tailored to specific production applications. During this phase, DOD funds may be used to develop technology for a production application but cannot be used to purchase capital equipment. Projects that do not require development or validation may move directly to Phase III. At the conclusion of Phase II, the contractor may submit a capital investment proposal. This specifies the type, cost, and timing of contractor investments and incentives desired.

During Phase III, the contractor buys and installs capital equipment and associated software. Weapon system program offices pay incentives in accordance with prior agreements.

During this phased approach, DOD and the contractor negotiate one or more agreements either as part of a weapon system contract or separately. These agreements may include:

--Memoranda of understanding, which are usually agreed to before or during Phase I. These memoranda, which are not binding, generally define the scope of the effort and basic roles of the contractor, weapon system program office(s), and other services.

--Framework business arrangements, which are usually negotiated at the end of Phase I or early in Phase II. These arrangements vary considerably but generally lay out the types of incentives to be used, the general level of contractor investment expected, and the bases on which the investments will be analyzed.

--Implementation business arrangements, which are usually negotiated just prior to Phase III. These arrangements, which are binding, detail the exact investments to be made, estimated cost reductions, the amount and timing of incentive payments, and the method for verifying and tracking benefits. The arrangements also include any investment protection guarantees.

An IMIP effort can include one or more weapon system programs, contractors, or benefiting services. For example, the General Electric Company engine IMIP effort involves multiple weapon systems, several subcontractors, and all three services--with the Air Force as the lead service. Unless specified, further references to IMIP efforts in this appendix refer to single contractors and are categorized by lead service.

Objectives, scope, and methodology

The objectives of our review were to determine how well the IMIP test was carried out and how well the program was managed. We focused primarily on the Air Force because it has had more experience in managing IMIP efforts than the other services and, therefore, had a major influence in developing program policy and guidance. We conducted limited discussions with Army and Navy officials regarding their efforts and the IMIP test.

Audit work was conducted at various Office of Secretary of Defense and service headquarters offices, Washington, D.C.; Air Force Systems Command, Andrews Air Force Base (AFB), Maryland; Aeronautical Systems Division, Wright-Patterson AFB, Ohio; Electronic Systems Division, Hanscom AFB, Massachusetts; Army Materiel Command, Alexandria, Virginia; Naval Material Command, Crystal City, Virginia; and two contractors' plants. We met with cognizant officials at each location and examined IMIP documents such as contracts, status reports, test and program plans, business arrangements, policy statements, and budget documents. Our audit, performed during the period August 1984 through February 1985, was conducted in accordance with generally accepted auditing standards.

We did not evaluate alternatives to IMIP or review the need for modernizing the industrial base. We examined DOD reports and documents on cost reductions resulting from IMIP, but did not attempt detailed verification of these reductions. Most IMIP efforts have not progressed to the stage where benefits have been achieved. The few efforts in which benefits have been realized still have several years before total anticipated benefits are achieved.

POTENTIAL BENEFITS SUBSTANTIAL BUT VISIBILITY AND ACCOUNTABILITY ARE NEEDED

DOD estimates that ongoing IMIP efforts for which projected benefits have been quantified will reduce DOD's procurement costs by a total of about $6 billion over the next 8 to 10 years, as well as provide other benefits. Benefit projections are less accurate in early stages, and very few IMIP efforts have reached a stage where benefits are being realized.

Furthermore, the cost reductions are reported inconsistently and are not always included in weapon system program budgets or cost estimates. Other benefits, such as increased surge capability and reduced lead time, are considered significant but are less easily quantified.

Most cost reductions yet to be achieved

Most of the $6 billion in projected cost reductions are based on IMIP efforts which are in Phases I and II and are subject to change because of the estimating inaccuracy in these phases. For example, the following chart shows that, of all 50 ongoing IMIP efforts--some of which include more than one contractor--45 are in Phase I or II and five are in Phase III.

Phases and Projected Cost Reductions for IMIP Efforts

	Phase I	Phase II	Phase III	Total
	----(in millions of dollars)---			
Air Force				
Efforts[a]	12	16	5	33
Cost reductions[b]	$ 199	$2,657	$1,383	$4,239
Navy				
Efforts	9	5	0	14
Cost reductions[b]	$ 862	$ 745	0	$1,607
Army				
Efforts	3	0	0	3
Cost reductions[b]	$ 831	0	0	$ 831
Total				
Efforts[a]	24	21	5	50
Cost reductions[b]	$1,892	$3,402	$1,383	$6,677

[a]Eight Air Force efforts in this chart include more than one contractor and/or subcontractors and vendors. All 77 contractors participating in Air Force efforts are included.

[b]Benefits for fifteen efforts had not been quantified at the time of our review. For the remainder, the consistency and bases for reporting benefits vary substantially.

The accuracy of IMIP benefit projections varies depending upon the phase of the IMIP effort. As IMIP efforts enter Phase III, projections become firmer. The Rockwell International

portion of the B-1B program IMIP effort is an example of an estimate that was reduced over 90 percent as it approached Phase III. This estimate declined $375 million, from $400 million in June 1983 to $25 million in March 1985.

For the IMIP efforts that have begun to achieve results, the total projected cost reductions will not be realized for several years. The F-16 General Dynamics and Westinghouse IMIP efforts are examples.

--The F-16 program office is projecting about $519 million in cost reductions through 1991 for the General Dynamics IMIP effort, one of several efforts benefiting the F-16 program. This amount is based on a projected production of 2,219 aircraft estimated to cost about $40 billion. The F-16 program has realized, through contract reductions, $163.5 million in cost reductions from IMIP through fiscal year 1984. The government has paid $53.1 million in direct funding or incentives. Therefore, the F-16 General Dynamics IMIP has reduced government net costs about $110.4 million, or about 3 percent of the airframe cost through fiscal year 1984.

--The initial Westinghouse Electric Corporation IMIP investment is projected to reduce costs by a total of $190 million on 3 out of the 21 benefiting weapon systems through 1992. The government provided no direct funding for this effort. As of March 1985, price reductions, which were split equally between DOD and Westinghouse, have totaled $12.05 million on the F-16 radar system. As negotiated, Westinghouse can earn no more than $22.3 million in incentives.

Benefits not uniformly reported

Uniform information on actual and projected benefits does not exist. Consistent information on government costs incurred also does not exist. While the services submit reports on the status of IMIP to OSD, these reports neither include all projected benefits nor provide comparable data. The Air Force is developing an IMIP information system, but has not yet provided guidance on how benefits and costs are to be reported.

Projected benefits are reported within the services and to OSD inconsistently. For example, estimates are:

--Either gross or net (DOD incurred costs are deducted) projections.

--Either in then-year or constant dollars.[2] The General Dynamics benefits are in then-year dollars. The Westinghouse benefits have been reported in constant dollars but, in 1984, were reported in then-year dollars.

--For selected weapon system programs or for all affected programs. The reported benefits from the Westinghouse IMIP effort include only 3 of the 21 benefiting weapon systems.

These reporting methods can result in over- or understated benefits to the government, particularly in relation to the cost of the program. For example, reporting gross benefits without also reporting costs presents an unbalanced view of program effectiveness. Reports in then-year dollars do not provide an accurate accounting of program effectiveness, because both costs and benefits occur over a number of years. For example, then-year dollars do not show the greater value of cost incurred early in the program to benefits which occur later. Reports in constant dollars eliminate the effect of inflation, but do not reflect the time value of money as discounted dollars would. Reporting benefits and costs in discounted dollars would more accurately reflect the program's value and its cost-effectiveness.

The bases for benefits are not specified in the reports. Reported benefits may reflect projections for selected weapon systems only rather than all affected systems. The phases in which projections are made are not necessarily reported, and therefore, no indication exists as to how firm the projections are. Reported benefits may also be a combination of actual and projected cost reductions. Thus, comparable information which can be used to make program decisions and assess effectiveness does not exist.

Effects on weapon system costs need greater visibility

IMIP benefits are currently being treated inconsistently in weapon system budgets and cost estimates, decreasing the visibility of and the accountability for the effects on weapon system costs. Because most IMIP efforts are in the initial phases, many weapon system program offices have not had to incorporate actual cost reductions into their program budgets or

[2]Then-year dollars are based on projected inflation rates for the years in which benefits will be achieved; thus, if a 5-percent inflation rate is projected, $1 in the first year is $1.05 the following year. Constant dollar projections eliminate the effect of inflation.

cost estimates. Neither OSD nor the services have developed guidance as to how and when IMIP benefits should be included in budgets and cost estimates. Consequently, program offices are treating IMIP benefits inconsistently. For example:

--In 1979, as the General Dynamics IMIP effort entered Phase III, the F-16 program office reduced its cost estimates from 1978 through 1986 by a total of $220.2 million based on projected IMIP cost reductions. Subsequent budget requests reflected the lower target cost.

--In March 1985, as the B-1B IMIP effort (which includes eight contractors) approached Phase III, projected cost reductions were $150 million, but the program office had not made any reductions in its cost estimates or budget.

A major reason cited by Air Force officials for this inconsistency is that, prior to actual contractor investment, the amount of projected cost reductions can change substantially. According to them, estimates of cost reductions are larger in the early stages of the program and weapon system program offices do not want to commit to optimistic projections. As IMIP efforts enter Phase III, estimates become firmer, but program offices are not obliged to document or report the projected effects of IMIP on program cost.

Other benefits considered significant

Most IMIP efforts are expected to provide benefits in addition to cost reductions such as improved quality, shortened lead time, and increased surge capability. Service officials consider these additional benefits to be significant, and sometimes equal in importance to acquisition cost reductions. They plan on directing some IMIP efforts at industries where they have identified particular problems such as the traveling wave tube (TWT) industry. The DOD demand for TWTs, a critical component of radar systems, is expected to increase significantly, and sales could approach $4 billion over the next few years. TWT manufacturing has been plagued by poor TWT life and low production yields, raising concerns as to whether the TWT industry can meet DOD demand. The TWT IMIP effort is directed toward improving production capability by increasing automation.

Conclusion

We believe that while IMIP has shown the potential for reducing DOD acquisition costs and providing additional benefits, DOD needs better information on the effects of the

program and how well program objectives are achieved. When benefits are not incorporated into weapon system program budgets, the results of IMIP are obscured. Visibility and accountability will continue to be hampered unless costs and benefits are reported consistently and guidance is developed on incorporating projected benefits into budgets.

IMIP POLICY AND GUIDANCE CAN BE IMPROVED

The IMIP test is scheduled to end in the fall of 1985, but some issues regarding program management remain unresolved. The test phase provided OSD and the services an opportunity to refine and assess various approaches. The draft guidance does not adequately address several issues that could have a substantial impact on the program's cost and benefits. The steering group could improve the guidance by addressing the following questions: (1) when and to what degree is government funding in the government's best interest, (2) what business arrangements best meet program objectives and minimize government cost, and (3) what incentive mechanisms should be used with subcontractors and vendors?

Test not structured to address major issues

A major reason the draft guidance does not adequately address some issues is the manner in which the test was carried out. The steering group addressed some major issues--such as management roles, benefits tracking, and contractual requirements--but did not establish a plan to respond to other important issues in the charter establishing the test.

The IMIP test charter established an IMIP steering group to

--monitor the conduct and results of the test program and

--evaluate the success of the various incentives and the overall program.

The charter gave the services authority to pursue a variety of approaches to implement IMIP. Based on its evaluation of the services' experience, the steering group was to develop IMIP policy and recommend specific changes to the Federal Acquisition Regulations. The charter included examples of issues to consider including funding, measurement of cost reductions and other benefits, effects on competition, and ways to ensure that

incentive provisions could be successfully employed by subcontractors and vendors.

The primary objective of the test was to develop and issue IMIP guidance. To achieve this, the group had a contractor document the experience of three IMIP efforts and develop a model to analyze proposed contractor investments. In addition, the group listed types of IMIP efforts the services should consider starting, including efforts

--affecting more than one weapon system program,

--having a principal goal of reduced lead time and expanded surge capability,

--involving more than one service,

--receiving no direct DOD funding, and

--involving subcontractors and vendors.

The steering group developed draft guidance in late 1984 consisting of changes to the acquisition regulations, a DOD directive, and an IMIP guide. The draft guidance deals with some issues in depth such as management roles and basic program requirements.

The steering group could have potentially improved the draft guidance if they had developed a plan to address issues raised in the charter and if tasks that were undertaken had been further developed. For example, the effects of or need for funding were not specifically addressed by the steering group. The differences in IMIP efforts with prime contractors and subcontractors were also not addressed directly. The steering group had a contractor document three IMIP efforts but directed the contractor not to rate the efforts, as the group did not want an "audit midstream." The contractor did not have access to some information necessary to fully analyze the IMIP efforts, and two of the studies were not completed prior to the development of the draft guidance. Further, the three IMIP efforts do not cover the spectrum of approaches used. The other primary source of information was annual status reports submitted by the services. They were general in nature and did not discuss many program management issues in depth.

Direct funding needs further assessment

The services have carried out different policies regarding IMIP funding, but neither OSD nor the services have adequately interest of the government. The draft guidance states that

"contractors should conduct IMIP efforts without direct or indirect government funding. However, when it is in the government's best interests, government funding may be provided." Representatives of all three services and OSD recognize that the guidance needs to be changed because the services have used either direct or indirect government funding. The guidance does not provide criteria for determining when funding is in the government's best interest or for what purposes funding is to be provided.

The Navy, when the lead service, has not provided direct funding but has allowed indirect funding for IMIP. However, Navy program officials are requesting $2 million for fiscal year 1987 to provide direct funding for IMIP Phase I efforts for small businesses. The Army provided direct funding when it was initially involved in the program and is requesting $5.9 million for IMIP in fiscal 1986. The Air Force may provide direct funding for Phase I and often provides direct funding for Phase II.

Navy officials believe that by not providing direct funds to prime contractors, they are reducing the overall cost of the program. Contractors that undertake Phases I or II without direct government funding are usually allowed to charge these expenses to overhead or other accounts in production programs or have the expenses offset through the incentive payments. Therefore, while IMIP is not directly funding the efforts, weapon system production programs are paying for contractor efforts. Further, when indirect funding is used, the government usually has no rights to transfer developed technology to other contractors for their manufacturing efforts.

From fiscal 1978 through 1984, the Air Force provided contractors over $260 million in direct funding for IMIP. The primary sources were $173 million in industrial preparedness funds allocated specifically for IMIP and $88 million in weapon system program funds. For fiscal 1985, the Air Force budgeted $40.6 million specifically for IMIP. Air Force officials believe that direct funding can help achieve

--increased contractor investment by showing Air Force commitment to the program,

--a higher degree of modernization since risk of technology development to the contractor is lowered,

--greater top-level corporate commitment to investment and modernization, and

--transfer of developed technology since the government usually has the right to transfer the results

of directly funded Phase II projects to other contractors.

According to officials of one company, the Phase II funding of $3.6 million was more important than incentive payments. The company agreed to implement three out of its four Phase II projects without receiving incentive payments. Another company developed technology in a Phase II project but decided not to implement the technology. Because Phase II funding was provided, the technology is being transferred to another contractor who plans to use it.

Some analysis of the effects of funding has been done. A limited study by the Air Force Aeronautical Systems Division (ASD) suggests that direct funding may cause an increase in contractor investment. It suggests that funding is most effective with firms that do not contract directly with the government. The results of the ASD study showed that:

--Contractors with a high percentage of direct government business invested $2 for each Air Force dollar.

--Contractors with about 50 percent direct government business invested $5 for each Air Force dollar.

--Contractors with little direct government business invested $7 for each Air Force dollar.

The study, however, has limitations. The investment-to-funding ratios of 13 IMIP efforts were calculated without demonstrating a cause and effect relationship or considering other factors that could affect investment rates. Some data on investments are based on contractor projections made in early IMIP stages, while other data are actual amounts of investment. Nevertheless, the ASD study illustrates the type of analysis needed to demonstrate the effects of funding decisions.

Both Air Force and Navy officials believe direct funding may also be more necessary and more beneficial at subcontractor and vendor facilities. As a result, the Navy IMIP--which has provided no direct funding--is requesting $2 million in fiscal 1987 to fund Phase I vendor factory analyses. Air Force officials believe funding Phase I at a subcontractor or vendor is frequently necessary to ensure a complete and more timely factory analysis.

The General Dynamics Corporation reviewed the effects of Air Force funding at its subcontractors and vendors that are participating in one IMIP effort. Results of this review are shown in the following chart.

Comparison of Directly Funded
and Not Directly Funded Subcontractors and Vendors
(General Dynamics Study)

Directly funded	Not directly funded
Generated more savings	Generated less savings
Generated more and higher and quality projects	Generated fewer projects and tended to be low risk
Completed factory analysis in 6 to 12 months	Completed factory analysis in 9 to 15 months
More thorough factory analysis and viable strategic plan	Tended to shortcut factory analysis and develop patchwork plan
More likely to use consultant	Less likely to use consultant
More likely to dedicate full time staff	More likely to assign as collateral duty
Consistently higher motivation	Interest level fluctuated

This review also had limitations. For example, it did not differentiate between large companies that are subcontractors or vendors and small businesses. It also did not specify or appear to consider the reasons some companies received direct funding and others did not. Further, the results regarding generation of savings are based on projections made in the early phases.

Business arrangements need further assessment

IMIP business arrangements are complex and vary considerably. For example, the Air Force and Westinghouse spent over 2 years negotiating a Phase II business arrangement. The IMIP test charter encouraged the services to be flexible and use different approaches during the test, but the steering group did not consider all of the effects of the approaches on cost and benefits. The charter also gave the IMIP steering group responsibility for evaluating the various approaches as a means for determining new policies. The steering group focused attention on the need for financial analysis of proposed investments and recommended that one discounted cash flow model be used for this purpose. We believe the proposed model can be improved with minimal modification. In addition, clarification is needed regarding the consideration of lost profits and consideration of contractor and government risk.

Discounted cash flow model

A discounted cash flow model was developed during the test to replace the numerous models then in use. It does not, however, provide some information that the services should consider when determining whether a contractor should receive incentives for an investments and, if so, the amount of incentives to provide. Also, the model does not provide adequate information for analyzing investments from the government's perspective. With minimal modification, the model can be a more effective tool.

The purpose of the model is to provide an economic basis for calculating the amount of incentives required to stimulate investment. The model calculates the effect of an investment on a contractor's future cash flow, taking into consideration such elements as tax rates, depreciation, and relevant defense cost accounting standards. The model then projects one rate of return for that investment, which is compared to the rate required by the firm (and agreed to by DOD). If the projected rate is lower than the required rate, the model is used to help determine the incentives necessary to raise the projected rate. For example, if the projected return for an investment is 5 percent and the firm requires a minimum of 20 percent, the model helps determine what incentives will raise the projected return from 5 to 20 percent. The model becomes the basis for much of the negotiations surrounding the amount and timing of the incentive payments.

The model uses the internal rate of return method--commonly used by the private sector--to accomplish this financial analysis. This method has a flaw, however, that is particularly significant in the case of IMIP. In analyses of proposed IMIP investments, the projected cash flows often change signs--from negative in early years, to positive, and back to negative. In these instances, more than one rate of return can result--for example, 5 and 20 percent. However, the model will specify only one rate--for instance, 5 percent. The contractor that developed the model is including warning signals to tell the user when there is more than one projected rate. The model, however, will not specify what the various rates are. Further, even when the various rates are known, the internal rate of return method provides no means to determine which of the projected areas--such as 5 or 20 percent--should be used in determining incentive amounts. Multiple rates have been projected in at least one instance and many of the projected cash flows change signs more than once.

An alternative is the net present value method. Using this method, either alone or with the internal rate of return analysis, the same inputs would be required, and the information

would still be used to calculate incentive payments. One change that would be required in some efforts is negotiating the required rate of return prior to analyzing the investments. This method avoids the problem of multiple rates of return and provides a reasonable economic basis for calculating the effects of an investment on a contractor's cash flow. Therefore, this method would provide a more accurate, reliable tool for assessing proposed investments.

A second concern with the model is the manner in which government benefits are calculated. The model projects the effects of an investment on DOD procurement costs and on total government revenue--that is, DOD benefits plus the effect on tax revenue. While contractor benefits are discounted to show the time value of money, government and DOD benefits are not. Not discounting government and DOD benefits inflates future benefits. This distorts the government's view of the contractor investment proposal and increases the chance that the government will enter an unfavorable agreement.

Another problem with the model is that it does not specifically include gain or loss on disposal of equipment that is being replaced. IMIP is designed to produce investments in new equipment, so it is expected that old equipment must be replaced with resultant gains or losses. Including these gains or losses in the model would provide greater accuracy in determining appropriate incentives.

Lost profit

Lost profit--a factor used in the discounted cash flow model--can be a major determinant in calculating IMIP incentive payments. The draft guidance, however, provides no direction to the services concerning how to treat it. Lost profit occurs because profit is calculated as a percent of costs incurred in many defense contracts. Investments that cause costs to decrease cause profits to decline as well. Lost profit, therefore, is the estimated amount of profit the contractor would have received had costs not been lowered. The higher the estimated lost profit, the more incentives the government will have to pay.

We found a range of views among IMIP managers and DOD officials concerning the use of lost profit in IMIP financial analyses. These are

--including lost profit for 10 years,

--including lost profit for up to 5 years, and

--not including lost profit at all.

Investment analyses for IMIP efforts in Phase III that we reviewed included lost profit for 8 to 10 years--the total time span considered in the financial analyses. The reason for this practice, according to Air Force and contracting officials, is that once costs are lowered, the contractor's profit is lowered on all future DOD contracts.

The Air Force Electronic Systems Division (ESD) includes lost profit for no more than 5 years and then not at 100 percent. Limiting the time lost profit is considered in financial analyses lowers the amount of incentives paid. ESD officials believe that due to lower costs, contractors will become more competitive and overcome the effects of the lost profit through increased business. This assertion has not been studied to determine its accuracy, however. ESD has used this approach in analyzing Phase II projects, but has not yet used it to negotiate a Phase III arrangement.

In contrast, another philosophy is under consideration but has not yet been put into practice. The ASD Central Technology Modernization Office indicated lost profits may not be part of their Phase III negotiations. The ASD office has included the profit effect in their initial analysis of Phase II projects. In their opinion, lost profits should not be part of the evaluation process, because a contractor would not consider lost profits in evaluating a commercial investment opportunity. In the commercial environment, the contractor would evaluate the investment opportunity based on its capability to give them a return equal to or greater than the required rate of return without regard to lost profit. The officials believed the government should operate in a similar way.

The amount of time for which lost profit is considered is also important in considering investments that a contractor planned to make in several years but, due to IMIP, made sooner. When IMIP only accelerates investments, the inclusion of lost profit for a 10-year period appears unjustified. The draft guidance does not discuss differences between calculating incentives for those investments a contractor would not have made and those which would have been only delayed.

Contractor and government risk

Other factors of financial analysis that are important in determining incentives include consideration of contractor and government risk. Available options to address risk include

--investment protection,

--increased rates of return,

--incentive ceilings, and

--payment methods.

The draft guidance does not discuss the relative costs and merits of these options.

Contractor risk is treated very differently among IMIP efforts and can result from such conditions as uncertainties of weapon system requirements or the technological nature of the investment. Two primary options for addressing contractor risk are

--contractor investment protection which lowers contractor risk by requiring the government to acquire specific capital investments covered in the arrangement if affected weapon system programs are terminated, and

--an increased rate of return for specific investments which rewards risk-taking by increasing the potential incentive payments a contractor can earn.

Contractor investment protection has been included in five business arrangements. In one case, the protection was offered as part of multiyear production contracts. Three of the five IMIP efforts with investment protection also had negotiated higher required rates of return than those IMIP efforts without such guarantees. In the remaining two IMIP efforts that have investment protection, the contractor can also negotiate separate required rates for those investments viewed as higher risk. Allowing separate rates of return for different types of investments is also included in other IMIP efforts that do not have investment protection. No IMIP effort allowing different rates had entered Phase III, so no rates have been negotiated for high risk investments.

Contract options can also be used to reduce the government's risk of paying too much for the benefits achieved and to ensure contractor performance. Two options in IMIP for reducing the government's risk are

--ceilings or limits on the total amount of incentive payments and

--incentive payments only after certain critical contractor actions take place.

The draft guidance states that ceilings on the total amount of incentive payments should normally be provided. However, the draft guidance is not specific as to how the ceiling should be determined. The ceilings in the IMIP business arrangements we

reviewed were either based on the amount needed to raise a projected low rate of return to a required rate of return or on the amount of the investment. For example, the incentive ceiling on the Rockwell International portion of the B-1B IMIP effort was developed using the first approach. The ceiling on the Westinghouse IMIP incentive is the amount of the contractor's investment in then-year dollars. ESD plans to limit all incentive ceilings to the value of a contractor's investments.

The draft guidance discusses some payment options but provides little basis for determining which are most appropriate for limiting government risk. The degree of protection these schemes provide to the government varies substantially. In several IMIP efforts, the contractor receives 100 percent of actual price reductions until the incentive ceiling is reached. In another arrangement, DOD retains all the savings from cost reductions until the amount of government funds provided in Phase II are recovered. In other arrangements, the government and the contractor share the benefits equally until the incentive ceiling is reached.

Incentive payments also vary in how and when they are paid. Some arrangements seek to limit government risk and encourage the contractor to maximize the possible savings. The General Dynamics F-16 IMIP effort ties a portion of the incentive payment to overt contractor action. For example, the contractor receives a percentage of the available incentive for ordering the equipment on schedule, another percentage when the equipment is installed, and the remaining percentage when the savings are validated. The milestones were established to encourage timely contractor actions. In still another arrangement, the program office plans to pay the contractor the full lump sum incentive at the time the contract price reduction is made. This scheme requires fewer contractor and government resources to administer than the first approach, but may also reduce overall program benefits.

Incentive mechanisms for subcontractors and vendors need further development

The Air Force and the Navy are attempting to include more subcontractors and vendors in IMIP. The draft guidance strongly encourages these efforts and describes the administrative structures that can be used. It does not, however, adequately answer three basic questions:

--What are the appropriate savings tracking mechanisms to be applied to subcontractor or vendor IMIP efforts?

--What changes are necessary in the analysis of investments at the subcontractor or vendor level?

--What is the possible effect on subcontractors and vendors of the proposed system to allocate incentive payments among weapon system program offices?

The services have gained enough experience to provide the steering group information necessary to begin evaluating the various problems and approaches. Because the services are proceeding rapidly to involve vendors and subcontractors in IMIP, guidance needs careful evaluation and development.

OSD and the services believe that significant cost savings can be achieved by encouraging subcontractors and vendors to modernize, since approximately 65 percent of DOD procurement dollars go to that level. As of March 1985, 43 subcontractors and vendors were involved in IMIP. Most of these are involved with either Air Force IMIP efforts or multiservice IMIP efforts for which Air Force is the lead service. The Navy has signed Phase II agreements with three subcontractors and is encouraging participation of more.

The draft guidance describes the two basic methods for administering IMIP efforts with subcontractors and vendors. The subcontractors and vendors are included in IMIP either through a contract between a prime contractor and its subcontractors and vendors or directly with one of the services. When the contract is between the prime and its subcontractors, the prime contractor has the responsibility to review the Phase I analyses and Phase II project proposals, negotiate the Phase II and III business arrangements, and ensure that benefits flow back to the government. The service must approve the business arrangements.

The first subcontractor and vendor involvement in IMIP was on the F-16 program. General Dynamics, the F-16 prime contractor, manages the program which, as of March 1985, involved 24 subcontractors and vendors. Through fiscal year 1984, the Air Force provided direct funding of $15.3 million for that effort and is estimating $520 million in gross benefits through fiscal 1990 for 19 of those companies involved. The Air Force now has five prime-contractor-administered IMIP efforts (each involving more than one subcontractor) and the Navy has one. In some instances, the service works directly with the subcontractor. This is particularly true in those cases where it can reach an entire industry segment, such as in the traveling wave tube IMIP effort discussed on page 8.

The draft guidance does not provide adequate direction on tracking benefits at vendors and subcontractors. Tracking cost reductions to the government through the various levels can become much more complicated than at the prime contractor level. If the vendor or subcontractor supplies more than one prime contractor for both defense and commercial products, then

tracking is more difficult. The complexity increases when IMIP efforts are directed to lower tier vendors--those that do not supply the prime contractor directly. Further, many subcontractors and vendors do not have to comply with cost accounting standards. This increases the difficulty of auditing results. In some instances, subcontractors and vendors agree to forego incentive payments if they receive Phase I or II funds.

Changes in how investments are analyzed may be necessary at the subcontractor and vendor level. A prime contractor's profit is normally based on cost. With subcontractors and vendors--and particularly those at the second and third tiers--profit may not be tied directly to cost. When profit is not based on cost, existing mechanisms for calculating incentive payments may not be appropriate. Other factors such as limited cash flow may be more important in determining how much a vendor is willing to invest. Some of the discounted cash flow models currently used in vendor IMIP efforts do not include lost profit. The model proposed for use throughout the services has not yet been tested at the subcontractor or vendor level to determine if its assumptions are appropriate. In addition, the draft guidance does not address lost profit at the subtier level.

The steering group approved the use of a contract clause--referred to as the productivity sharing reward factor--to allocate payments of IMIP incentives among benefiting weapon systems. This contract clause is intended for use in IMIP efforts that affect several weapon system programs, a situation often occurring at vendors and subcontractors. For example, General Dynamics found that 80 percent of its F-16 program subcontractors participating in IMIP are B-1B subcontractors and 45 percent are involved in production of the Advanced Medium Range Air-to-Air Missile program. Although these programs will benefit from the IMIP effort, only the F-16 program office pays the incentives to the vendors and subcontractors. The productivity sharing reward factor was designed to require the other programs to pay a portion of the incentive.

This contract clause is part of the draft guidance, but it has not yet been tested. For several IMIP efforts--such as the F-16 subcontractor and vendor effort--decisions were made not to include the clause. Several Air Force and contractor officials believe that it will increase rather than decrease the administrative burden. Some contractors are concerned that the incentive payments will be affected--either the incentive amounts will make them less competitive for new contracts or will be negotiated as part of the overall contract, thus, reducing the effect of the payments. The clause is being considered for use in several IMIP efforts, but as of March 1985, it had not been included in any business arrangement, although the steering group had intended that it be tested.

Conclusions

We believe that, with further analysis, the steering group can improve the draft IMIP policy and guidance. Additional clarification on issues such as the impact of funding and the appropriateness of certain business arrangements at prime contractors, subcontractors, and vendors will help to insure IMIP achieves maximum benefits at the least cost. A number of approaches were used during the IMIP test and, therefore, a basis for analysis exists. However, we believe that continual evaluation and oversight will be needed because the program is still evolving and many issues, particularly those related to subcontractors and vendors, are emerging.

IMIP NEEDS A STRUCTURED PLANNING AND PROGRAMMING PROCESS

The development of programming and planning structures has not kept pace with the growth of IMIP. The program has grown from one contractor in 1978 to 94 contractors in early 1985. All services are planning to further expand their programs. Attention to the elements of effective planning and programming can improve these programs.

Effective planning and programming requires reliable information on past performance, systematic consideration of alternatives and careful analysis of their long term consequences. The Air Force has made significant progress in developing an effective planning and programming system. The Army and the Navy have not progressed as far but their IMIP officials recognize the need for a structured approach to planning and programming.

The Air Force has begun to integrate its production base analysis with the IMIP. The production base analysis, while not done solely for IMIP, is used to identify needed industrial base improvements which IMIP could address. For example, the 1984 Air Force analysis identified radars as a common lead time and cost driver in aircraft production and an IMIP effort regarding radar systems on the F-14, F-15, and F-18 aircraft resulted. The Navy and the Army do not use production base analyses in IMIP planning and programming but IMIP officials in both the Army and the Navy believe IMIP would benefit from doing so.

Most Air Force IMIP funds go to ASD and ESD. ASD is developing the ability to apply analytic techniques in assessing issues and alternatives. One ASD official stated that ASD has agreed upon thirteen criteria and they plan, with the participation of Air Force Systems Command, to assign numerical

weights to the criteria for funds allocation. ESD is planning to integrate the results of the analysis with its portion of the program, but has not yet determined how that will be done.

According to an ASD official, a weighted decisionmaking process would add structure to the process and result in better decisions. Guidance from a former Deputy Secretary of Defense to improve DOD management states "responsibility, authority, and accountability" for programs should be at the lowest levels of the organization at which a total viewpoint of the program rests. ASD officials believe their approach would remove some questions about IMIP decisions by higher levels and allow decentralized management. The Army and the Navy have not implemented an analytic approach to the extent the Air Force has. The Army and the Navy do not currently allocate IMIP funds but they may in the future. For example, Navy IMIP officials have requested fiscal year 1987 IMIP funds to support factory analyses at small businesses.

Air Force Systems Command, which manages the majority of IMIP efforts within the Air Force, is developing an IMIP information system. The purpose of the data base is to provide useful program performance information to those who need it for decision making. This system is expected to be operational by the end of fiscal year 1985. As previously discussed, the Air Force system needs improvement with regard to the way information is reported. The Army and the Navy have far fewer IMIP efforts than the Air Force and have not established such an information system. As they continue to expand their programs, they will need a similar mechanism to support planning and programming.

Conclusion

The methods used by the Air Force to manage their planning and programming of IMIP efforts are more structured than those used by the other services. Use of production base analyses can give strategic direction to IMIP efforts. Development of criteria for IMIP effort selection can further direct the efforts and a centralized information system can provide essential performance data and lessons learned for program management. As IMIP continues to evolve, the need for a more structured planning and programming process will continue to increase. IMIP planning, programming, and budgeting is the responsibility of the services. OSD has responsibility to ensure that the mechanisms they implement are adequate.

IMIP EFFORTS AS OF FEBRUARY 1985

IMIP effort	Phase	Projected benefits (000,000)	Affected weapon systems or components
Air Force			
AVCO	I	a	Multiple
General Electric (Space)	I	a	Milstar, DSCS III
GTE	I	a	Multiple
Hughes (Space)	I	a	Milstar, DSCS III
Lockheed	I	$ 4	Milstar
Magnavox	I	28	GPS
Magnavox	I	a	Multiple
Milstar-Contractors[b]	I	a	Milstar
Raytheon	I	63	AMRAAM
Sonicraft	I	10	JTIDS
Texas Instrument Subcontractors[b]	I	a	LLLGB, Others
TWT Industry[b]	I	94	Traveling wave tubes
BMAC	II	600	B-1B, KC-135
Cleveland Pneumatic	II	a	B-1B, F-15, Others
Fairchild	II	50	T-46
GE (Engines)[b]	II	600	Jet Engines
Hazeltine	II	25	JTIDS
Honeywell	II	16	Peacekeeper
Hughes	II	273	AMRAAM
Hughes[b]	II	a	Tow, Phoenix AMRAAM
Martin-Marietta	II	75	LANTIRN
Pratt and Whitney[b]	II	650	Jet Engines
Raytheon	II	a	Multiple
Rockwell Autonetics	II	16	Peacekeeper
Rockwell Collins	II	139	JTIDs, GPS
Rockwell/AIL[b]	II	250	B-1B
Singer-Kearfott	II	28	JTIDS, Others
Williams	II	160	ALCM, ACM, Others
F-16 Subcontractors[b]	III	557	F-16, B-1B, AMRAAM, Others
GE (Electronics)	III	a	Ground radar systems
General Dynamics	III	519	F-16
Lockheed	III	7	C-5A
Westinghouse	III	300	F-16, B-1B, E-3A ALQ-131

APPENDIX II

IMIP effort	Phase	Projected benefits (000,000)	Affected weapon systems or components
Navy			
Allison	I	$250	T-56/501 Engines
General Electric	I	275	Standard Missile
IMCO	I	20	MK-12, MK-70, SM-2
Novamet	I	100	MK-50 Torpedo
Lockheed CALCA	I	a	P-3C, S-3B
Hughes GSG	I	200	ADCAP, UYQ-21, MEWS, JTIDs
National Forge	I	17	Ship propulsion shafts
B.F. Goodrich	I	a	Sonars
General Dynamics (Pomona)	I	a	SM-2
McDonnell-Douglas	II	a	Harpoon
Grumman	II	300	F-14, A-6, Others
Hughes RSG	II	100	Radars
Northrop	II	250	F-18A
Morton-Thiokol	II	95	MK-104
Army			
Bell	I	243	AHIP
General Dynamics	I	468	M-1 Tank
Hughes	I	120	APACHE

[a]To be determined.

[b]Involves more than one contractor, subcontractor, or vendor.

APPENDIX III

THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301

Acquisition & Logistics

(AM/IP)

26 JUL 1985

Honorable Charles A. Bowsher
Comptroller General of the
United States
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Bowsher:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "Industrial Modernization Incentives Program (IMIP): An Evolving Program Needing Policy and Management Improvement," dated June 21, 1985 (GAO Code 392019), OSD Case 6787. The DoD concurs with the findings and recommendations. The report presents an accurate, fair, and constructive assessment of the program. Comments on specific findings and recommendations are contained in the enclosure.

As indicated in the report, the IMIP has been in the test phase for the past two and one-half years. The DoD has gained considerable experience in applying the concepts underlying the program during this period, but recognizes further work in a number of areas is necessary as the program evolves and matures. The GAO report correctly identifies these areas. It is also the DoD position that basic policy documentation is needed in-place in the near term (subject to future revision). Accordingly, the DoD will begin formal coordination of policy documentation supporting IMIP and terminate the test phase in the next few months.

Portions of the draft policy documentation have already been revised to reflect recommendations in the draft GAO report. The definitions of savings and benefits, in particular, have been strengthened and revised to ensure consistency in reporting. Other GAO recommendations point to areas for further policy guidance development and proper program execution. The DoD will actively pursue all recommendations and, to this end, expects to retain the IMIP Steering Group (with its oversight and management responsibilities) as it moves from the test phase to broader implementation. Most of the remaining GAO recommendations will be accommodated within the next year.

The DoD appreciates the opportunity to review and comment on the draft report.

Sincerely,

James P. Wade, Jr.

Enclosure

GAO note: Page numbers in this letter have been changed to correspond to the appropriate pages in the final report.

GAO DRAFT REPORT DATED JUNE 21, 1985
(GAO CODE 392019) OSD CASE 6787

"INDUSTRIAL MODERNIZATION INCENTIVES PROGRAM (IMIP): AN ENVOLVING PROGRAM NEEDING POLICY AND MANAGEMENT IMPROVEMENT"

DEPARTMENT OF DEFENSE (DOD) COMMENTS

* * * * *

FINDINGS

o **FINDING A: Potential Benefits Of IMIP Substantial But Need Visibility And Accountability.** The GAO found that, while DoD estimates that ongoing IMIP effort for which benefits have been quantified will reduce DoD's procurement costs by $6 billion over the next 8 to 10 years, certain conditions make such estimates uncertain at this time. Specifically, the GAO found that over $5 billion of the savings are based on Phases I and II (factory-wide analysis and engineering application technology projects, respectively) projections, which are subject to change since they represent projected cost reductions based on projected results from projected investments. The GAO also found that such early estimates have varied substantially as efforts enter Phase III (equipment installation), i.e., the estimated IMIP benefits for the B-1B program declined 90 percent from $400 million in June 1983 to $25 million in March 1985, as the program approached Phase III. In addition, the GAO found that projected benefits are reported inconsistently and do not provide an accurate overview for monitoring IMIP.

  -- Either gross or net cost reduction projections are reported.

  -- Projections are in either then-year or constant dollars.

  -- Projections are for either selected weapons systems (such as only those providing IMIP program incentives to a particular contractor) or all affected weapons programs.

  -- Sometimes a combination of achieved and projected cost reduction (without differentiation between the two) are reported.

  -- Projections often are not in discounted dollars (to reflect the time value of money, i.e., IMIP expenses occur early while savings occur later).

The GAO also found that while IMIP effectiveness can best be measured through changes in the costs of weapons systems, neither the Office of the Secretary of Defense (OSD) nor the

APPENDIX III

Services have developed guidance for how and when IMIP benefits should be incorporated in weapons system budgets. The GAO noted that Air Force officials cited program managers' reluctance to commit themselves to optimistic cost reductions which can change substantially. Finally, the GAO found that most IMIP efforts are expected to provide benefits such as improved quality, shortened leadtime and increased surge capability, which Service officials consider significant and sometimes equal in importance to cost reduction. The GAO concluded that while IMIP has demonstrated the potential for reducing DoD acquisition costs and providing additional benefits, DoD needs improved data on realized and projected costs to establish program cost-effectiveness. The GAO also concluded that visibility and accountability will continue to be hampered unless benefits are reported consistently and guidance to weapons system program offices is developed on how to incorporate projected benefits into budgets and cost estimates. (pp. 2-4 Letter, pp. 4-9, Appendix I)

DoD RESPONSE: Concur.

- **FINDING B: Draft IMIP Policy And Guidance Can Be Improved.** The GAO noted that the IMIP approach began with one Air Force contractor in 1978, and in 1982, the Deputy Secretary of Defense established a tri-Service steering group to direct and monitor a test of IMIP and to develop program policy and guidance based on the Services' experience. The GAO found that the steering group addressed some major issues, but did not establish a plan to respond specifically to important issues, such as (1) the effects of or need for funding and (2) the differences in IMIP efforts with prime contractors versus subcontractors. The GAO also found that this was a major reason why the draft guidance, developed by the steering group and released for comment in December 1984, does not adequately address these issues. The GAO, consequently, found that DoD has an opportunity to improve the guidance specifically by addressing three areas.

  -- The draft guidance states that contractors should be encouraged to conduct IMIP efforts without direct or indirect funding and that direct funding should occur only when in the Government's best interest, but does not give guidance to aid the Services in determining when direct funding is appropriate. (The GAO noted that the Services have used both direct and indirect funding, and Air Force Officials--the Air Force has been the most heavily involved in the IMIP program--believe direct funding results in increased contractor investments and a higher degree of modernization, as well as transfer of developed technology to other contractors. Furthermore, the GAO noted that both Air Force and Navy officials believe that direct funding of Phase I at subcontractors and vendors may be more

necessary than at prime contractors, and these beliefs are supported by a limited study by the Air Force Aeronautical Systems Division (ASD)).

-- Guidance on IMIP business arrangements needs improvement by (1) modification of a discounted cash flow model developed by the steering group, (2) additional guidance on treatment of lost profits, and (3) additional guidance on definitions of risk and treatment of high risk investments. (The GAO noted that the draft guidance does not provide an adequate framework for selecting the options most appropriate to various differing circumstances.)

-- Incentive mechanisms for subcontractors and vendors need further development, as the draft guidance does not describe the substantial difference and problems in applying IMIP incentive mechanisms at the subcontractor and vendor lever.

The GAO concluded that business arrangements will have to be tailored for each IMIP effort; however, additional clarification of the impact, results and intent of various options will help to ensure IMIP achieves maximum results at the least cost. The GAO concluded, further, that with additional analysis of the numerous approaches used in the test, the steering group can improve the draft policy and guidance. Finally, the GAO concluded that continual evaluation and oversight will be needed due to the complexity of business arrangements, the time between start of IMIP and actual investment, and the evolving nature of the program--particularly subcontractor and vendor involvement. (pp. 1, 2, 4-7 Letter, pp. 9-12, Appendix I)

DoD RESPONSE: Concur.

o **FINDING C: IMIP Needs A Structured Planning And Programming Process.** The GAO found that a planning and programming process helps in meeting the basic decisions of where IMIP efforts are needed and how funds should be allocated, as well as in tracking past performance. The GAO also found, however, that except for the Air Force, planning and programming procedures have not kept pace with the growth of IMIP. The GAO further found that the Air Force has begun to integrate its production base analysis with the IMIP, so as to identify needed industrial base improvement which IMIP could address. For example, a 1984 Air Force analysis identified radars as a lead time and cost driver in aircraft production, which resulted in an IMIP on radars for the F-14, F-15, and F-18 aircraft. Also, Air Force Commands are developing weighted decision criteria and an IMIP information system. The GAO concluded that, as the Army and Navy expand their IMIP programs, they will need systems to identify IMIP projects which will achieve greatest benefits. The GAO noted that, while the draft guidance gives DoD components primary

APPENDIX III

responsibility for IMIP planning and programming, the OSD has the responsibility for ensuring that IMIP achieves maximum benefits to DoD. (pp. 2, 7-8 Letter, pp. 21-22 Appendix I)

DoD RESPONSE: Concur.

RECOMMENDATIONS

- **RECOMMENDATION 1:** The GAO recommended that the Secretary of Defense establish an IMIP reporting system that, as a minimum, collects data in both discounted and then-year dollars on gross benefits and government costs. (p. 4 Letter)

DoD RESPONSE: Concur. Changes have been made in IMIP policy documentation to the definitions of savings and benefits to strengthen visibility and ensure consistency in reporting. Additionally, the draft DoD Directive on IMIP requires the Services to make annual status reports to the Office of the Secretary of Defense. Future requests outlining the specific data inputs required will be structured in accordance with GAO recommendations.

- **RECOMMENDATION 2:** The GAO recommended that the Secretary of Defense develop guidance specifying how and when IMIP benefit projections should be included in weapon system program cost estimates and budgets. (p. 4 Letter)

DoD RESPONSE: Concur. Guidance in the specific area indicated will be pursued as a priority matter in future IMIP policy documentation revisions (see comments on Recommendation 3 below). As a minimum, guidelines will be established on how savings and benefits are to be identified and tracked and how adequate correlation between these and future prices and budgets are to be maintained.

- **RECOMMENDATION 3:** The GAO recommended that the Secretary of Defense direct the IMIP steering group to (1) expand the review of experience gained during the test and, to the extent possible, clarify draft policy and guidance and (2) monitor the continuing implementation of IMIP after the test and revise policy and guidance based on these evaluations. (p. 7 Letter)

DoD RESPONSE: Concur. Although the IMIP test phase will end with the impending introduction of IMIP policy documentation into the formal coordination process, the IMIP Steering Group is being retained to address issues such as those identified in the GAO report and to improve policy guidance. Some of the items identified by GAO will be addressed before the formal coordination process is complete. Others are dependent on gaining more experience as the program matures, and will be resolved in subsequent policy documentation

revisions, which we estimate to occur on about an annual basis.

- **RECOMMENDATION 4:** The GAO recommended that the Secretary of Defense review the IMIP planning and programming process in each Service to ensure the processes contain adequate structure to assure IMIP efforts are directed at those areas with greatest potential benefits. (p. 8 Letter)

  DoD RESPONSE: Concur. This will be accomplished through the vehicle of the IMIP Steering Group, as part of review of annual Service status reports (information on future year plans and opportunities will be specifically requested), during development of Defense Guidance each fiscal year, and through greater integration of IMIP into industrial base analysis efforts.

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