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PROCEEDINGS

Second

NAVMAT — INDUSTRY

Senior Executive Roundtable

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at the

UNITED STATES NAVAL ACADEMY

Annapolis, Maryland

on

March 26, 1981

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**PROCEEDINGS
OF THE
NAVMAT - INDUSTRY
SENIOR EXECUTIVE ROUNDTABLE
AT THE
UNITED STATES NAVAL ACADEMY
ANNAPOLIS, MARYLAND
ON
MARCH 26, 1981**

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EXECUTIVE SUMMARY

✓ On March 26, 1981, the U.S. Naval Academy hosted the Second Naval Material Command-Industry Senior Executive Roundtable at Annapolis. In attendance were 24 senior American industrial representatives and 23 Navy executive level participants including Admiral A.J. Whittle, the Chief of Naval Material and three of his Systems Command Commanders. This meeting brought together senior Navy and industrial executives to discuss issues affecting their business relations.

The meeting was a follow-on to a similar conference held on December 6, 1979, also at the Naval Academy, which set the stage for continuing and productive examination of the principal factors affecting the Navy's system of acquisition of weapons systems. Admiral Whittle stressed from the outset that the proceedings would be informal, would involve frank exchanges of views by both sides and he also asked that none of the participants be placed on the defensive. The principal objective of the meeting was to explore ways to improve the acquisition process thereby achieving more defense at lower cost, through needed changes in the acquisition process. This objective was generally achieved and it is likely that the emphasis being developed at the Secretary of Defense level (on April 30, 1981 Deputy Secretary of Defense Carlucci signed a memorandum containing 31 recommendations for improving the acquisition process) will insure OSD support.

This document is a summary of the issues discussed, positions taken and recommendations made at the meeting. The meeting was a significant milestone.

The American Defense Preparedness Association was, again, most pleased to assist the Chief of Naval Material in this program. We trust that these proceedings will prove to be of value not only to the participants at Annapolis, but also to others concerned with the acquisition of Navy Material.

Henry A. Miley, Jr.
Henry A. Miley, Jr.
President

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INTRODUCTION

For each of the issues discussed, a Navy spokesman opened the discussion period with a brief introductory statement to help focus on the topic, setting forth significant points as viewed by the Navy. Expression of views then followed among participants in an uninhibited manner. Each subject period was allotted approximately forty-five minutes.

The issues discussed are listed below in the order presented:
OMB Circular A-109; Impact and Concepts for Efficient Implementation
Independent Research and Development
Specifications and Requirements (Tailoring and Statements of Work)
Production Interruption
Extent of Competition (Prime/Subcontractor)
Production Capability and Mobilization
Material Lead-Time
Productivity and Manufacturing Technology
Multi-Year Contracting
Industry Innovation Review Board

In the following report of proceedings, each of the subjects, except for Production Interruption which was a late addition to the schedule, is presented with a brief synopsis which had been provided to participants in advance. Following the synopsis are introductory remarks by the Navy spokesman. Then a summary of the Navy-Industry discussions is given.

These proceedings are not a verbatim record. The substance of the opinions and ideas put forward, however, are recorded herein. Any conclusions or recommendations, either explicit or implicit, are not official policy, but are included to provide a more complete summary and understanding of the issues discussed. The information presented in these proceedings is UNCLASSIFIED.

SUMMARY OF ADMIRAL WHITTLE'S OPENING REMARKS

Admiral Whittle welcomed to the Second NAVMAT-INDUSTRY Roundtable the thirteen Industry and ten Navy returnees, and greeted the new participants. He set the ground rules as informal, stating that he wanted a frank exchange of ideas, with both sides participating, and that individuals should not be on the defensive. He stated that the meeting was an attempt to improve the acquisition process in a group with common purposes. The need is for more defense at lower cost. To accomplish this, we will need changes in the acquisition process which the new Administration is willing to make. Strong support for changes appears evident from the Office of the Secretary of Defense. Admiral Whittle observed, in passing, that the Defense Department should not attempt to solve social problems through its acquisition process. He said that the report of the proceedings of the meeting would be provided to all participants and he would forward copies to OSD and appropriate Congressional staffs.

DISCUSSION TOPIC NUMBER 1

OMB CIRCULAR A-109; IMPACT AND CONCEPTS FOR EFFICIENT IMPLEMENTATION

A-109 was designed to assure effectiveness and efficiency of the process of acquiring major systems. We should have sufficient experience with A-109 by now to understand its good and bad features. Is A-109 a solution to the acquisition cycle problems and are there alternatives to A-109 that could accelerate the acquisition cycle?

NAVY INTRODUCTORY STATEMENT

Deputy Secretary of Defense Carlucci is currently reviewing Department of Defense acquisition policy and was scheduled to submit his report to Secretary Weinberger by March 30, 1981. Major changes to reduce the complexity of and shorten the acquisition process can be summarized as follows: It's a matter of needing to answer a threat twenty years from now with a program that takes fifteen years, using a planning cycle of five years, done by people on the job for three years with one year funding. A-109 details are considered too restrictive. There are parallel controlling government processes. First is the acquisition process which is event controlled and, second is the Congressional process which is calendar controlled. There are too many players in the decision cycle who create program delays and people do not always do the correct thing at the right time. Furthermore, there is the common nature to resist any change. It has been found that the front end funding is usually inadequate. Some have interpreted A-109 too narrowly. For instance, competitive prototyping is not required for every program. If the solution to a need is one platform, then we should get on with it. It appears that no one has come up with a good scheme to control costs or to provide realistic estimates, or to realistically present the best estimate up front for fear of killing a program at the start. Weapons systems acquisition is meshed with the government decision making process. First in consideration is the rationality of the process itself, which is being administered by a sometimes cumbersome organization while bureaucratic politics are ever present. It should be noted that the Navy issued fourteen approved Mission Element Needs Statements, MENS, through 1980 so the process is working and generating some of the front end paper. Vu-graphs used in this presentation are included as an appendix to these proceedings.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

Weapons systems acquisition has resulted in excessive detail highlighted by too many steps in the process (acquisition and appropriation timings are not matched); too many players and consequent resistance to change; excessively long production cycles and inadequate up-front financing.

People have also interpreted A-109 too narrowly, and since prototyping is not needed for every program and the solution to a need is one platform, we should come up with it and get on with the program. No one has come up with a good scheme to control costs, or to realistically estimate true costs from the start, for fear of killing off a program at inception. Weapons systems acquisitions are tied up in government decisions wherein rationale, bureaucratic policies and organizational processes are closely

intertwined and these, together, have a throttling effect upon performance. Since A-109 has been with us for five years and has proved to be impossible to implement satisfactorily, suggestions ranged from scrapping it altogether to more charitable solutions. Referring to the previous mention of the fourteen MENS approved by the Navy through 1980, it was stated that more mission analysis is required at the outset, and that a methodology is needed to determine NEEDS vs. WANTS. It was cited that the FFG-7 program worked well by having the correct work done up front partly because the program was competitive in its early phases. In this instance it was cited that A-109 had been implemented differently than planned because competitive prototyping had never happened as envisaged.

It was also held that A-109 had been written by idealists and was too synthetic and too far removed from reality. In consequence, it really served as a guide for the rest of government, rather than the Services. At the very least, the concept has to be endowed with more flexibility. Essentially, what is needful is to have the guts to do what is correct because, in the present context, pencil pushers are deemed to have usurped management responsibilities. We don't always know exactly what we need even though we think we do, and have let A-109 control us rather than vice versa. Directed procurement can cause us to miss new technology. Government should be able to shape the industry support base as desired.

The Deputy Secretary of Defense is currently reviewing DoD acquisition policy and his report to Secretary Weinberger is anticipated soon. Major changes to reduce and shorten acquisition times are anticipated.

INDUSTRY POSITION

Industry was asked whether it wanted to do away with A-109 and go to directed procurement; the responses were mixed. The FBM program was cited as an excellent example that had been impelled by directed procurement. Parallel development contracts, through engineering development, were held to be illogical and a waste of time and money. The time to FSED was held to be far too long, and prototyping was also considered wasteful because it was contended that the individual Service can evaluate competitors satisfactorily. "We do not have to fly an aircraft for four years to a decision" (i.e., regarding its acceptability)...You can reserve this type of selection for buying uniforms." Taking the CX as an example, it was contended that manufacturers can all build this type of aircraft and that the entire industry could go directly into full scale competitive development whenever needed. It was also contended that people employ specifications writing in order to send papers to each other instead of striving to achieve flexibilities.

RECOMMENDATIONS

It was agreed that the Services should be more flexible in applying A-109 and that Navy-Industry need to determine how to make A-109 work without following a cookbook approach. It was acknowledged that the Navy should tailor A-109 to meet more of its program needs, but it was also contended (by Navy) that it did not have the manpower to do this to the degree necessary. A-109 had, in part, been designed because industry wanted to be involved in the acquisition process. There was comment that, while Mr. Packard's original concept was good, it had been the elaboration of that concept that had caused problems. Business and economy, in the overall environment

of today, support making A-109 more effective and, in sum, there was agreement that A-109 is basically a workable concept, but it will require all working together to make it a useful tool. Vu-graphs used in discussion of this topic are located in the appendix.

DISCUSSION TOPIC NUMBER 2

INDEPENDENT RESEARCH AND DEVELOPMENT

The Navy has spent approximately \$3/4 billion annually on IR&D during the last five years. The benefits derived from IR&D are somewhat obscure. Ways to improve the understanding and recognition of the benefits of this program seem to be in order. The Navy would like to explore the techniques used by industry for; a) devoting their resources on selected research projects and, b) streamlining the flow of information to improve the effectiveness of the negotiation of IR&D advance agreements (i.e., on-site negotiations, improved technical evaluation, etc.).

NAVY INTRODUCTORY STATEMENT

The Navy has consolidated IR&D management in the Navy Material Command Headquarters which will provide clear direction to the subordinate commands within the Naval Material Command. There is a need to have better communication and interaction between the Navy and Industry at the technical level. The Naval Material Command will develop a five year IR&D plan with coordination and guidance from industry. The plan should clearly identify the Navy's objectives and goals, and provide an avenue for better communication. Industry efforts should be coordinated with the Navy technical base plans, but they should still be independent.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

Considerable discussion centered around manufacturing technology and whether it should be identified within the IR&D account. The overall consensus of opinion was that manufacturing technology and IR&D are equally important but that the former should be identified under a "burden" account. The Navy has attempted to identify separate funds for manufacturing technology but has not been totally supported by OSD. Timing and environment are right today for manufacturing technology programs.

IR&D and manufacturing technology have been structured in a ratio of about 10 to 1 in terms of aerospace vs. shipbuilding. We have been starving the shipbuilding industry, one reason being that there has been a narrow interpretation of military versus commercial values. This is expected to change.

NAVY POSITION

The Navy share of the U.S. total of \$2.5 billion expenditure per year on IR&D is \$750 million. This is equal to the USN in-house total for Basic Research/Exploratory Development. The Systems Commands do not now appear to be involved in evaluation of the "I" (Independent) slice of IR&D, but mainly in output. However, this will change beginning 1 October 1981.

Such timing of government involvement in initial planning is considered appropriate for manufacturing-technology support—an area where the Navy has been concerned but to a minor extent to date. Manufacturing technology proposals are difficult to support

because of the necessity to prove military payoff. Congress had put \$5 million in the 1982 budget for such support but DoD took it out; however, Navy expects this to be re-instated. Attendees agreed that manufacturing technology support should be identified industrially and not by IR&D in the overhead account. Funds in IR&D currently available are insufficient so that MT work should be separately funded. More in the MT area is needed in shipbuilding; MARAD (Maritime Administration) has assisted in this area.

There is some excellent naval IR&D going on and some that is not so good—most effort is in the near-term, and product-improvement oriented. There have, nevertheless been many criticisms of IR&D, along the following lines: Its content is sometimes considered debatable; excessive focus on the near-term; duplications of effort; weak evaluation processes; not necessarily being militarily relevant; and that proposal timing is not necessarily coordinated with R&D planning. U.S. management of IR&D is not concentrated. How can the process be improved in order to maintain "I" and yet comply with DoD rules? There should be guidance given to industry by the USN along with dialogue within Navy at the technical level and better efforts at evaluation. USN FY 83-86 plans should be shown to industry to permit coordination of efforts.

A 5-year look is being taken at the Tech Base ('83-87) to determine what Navy thinks it needs. No such long-term view has been taken previously and although MARAD helps the shipyards in this area, the Navy has not; the Navy, however, is beginning to collaborate and is now aiding two shipyards. There is participation with MARAD in the program and the Navy effort is expected to grow.

The Bath Shipbuilding Company has been fortunate with its major production program (FFG-7 class frigates) and has been able to invest in increasing productivity. Vendors have been the problem—on their military side they're old, whereas on the commercial side they're modern. Standards (military specs) take too long and it was advocated that the Navy should use commercial standards for service force/auxiliary ships.

Whereas shipbuilding has starved for IR&D, this is now expected to change. There is Man-Tech money available now for shipbuilding and there will be new initiatives from NAVSEA in this area.

INDUSTRY POSITION

The Congress has questioned industry overhead rates because placing manufacturing money into overhead has the effect of raising costing though, ultimately, this lowers unit prices. It was emphasized that the Congress would have to be educated on this point.

Where is Navy IR&D in shipbuilding? The complaint was registered that there is no Navy involvement. Industry representatives want flexibility to shift IR&D funds from one division to another in order to utilize resources more efficiently. A Group Pool may be the answer but although Lockheed uses a Group Pool for LMSC, funds cannot be given to the aircraft people. (AF IR&D evaluators do not accept outside inputs.)

It was emphasized that the Systems Commands should become involved (as pointed out in the Navy position, above, they will be after October, 1981).

Other points emphasized were that IR&D not be diluted because it is already too small; that productivity could, however, be funded into R&D, inclusive of robotics for automated manufacturing; that clarification be sought regarding the status of value engineering and how it interfaces with IR&D and, that manufacturing be placed in a separate account for review at this time because the timing is considered opportune.

RECOMMENDATIONS

Interaction between industry and the USN is needed in planning to prevent duplications and emphasize certain areas. Industry does not get to see internal USN guidance but it was felt that they should be apprised. Industry should also be able to obtain proposals a year ahead of the year of performance so as to integrate with the USN. Such internal information would be furnished to industry for guidance/information--not as direction. It was stated that NAVAIR does a version of this now, but it was pointed out that such a policy has to be exercised with care or it might become counter-productive.

Attendees agreed that it is necessary to have IR&D flexibility to shift funds from one pool (division) to another in order to have effective management control over such funds. Navy proposes to research this issue as part of the follow-on to the meeting.

The Navy is developing a five year plan for IR&D. Industry will be requested to inform the Navy on what is required to support the plan and thereby attain better communciations between the two to provide adequate mutual support for IR&D. Naval Air Systems Command has a five year IR&D program plan and it seems to work. Naval Material will use this and other elements from its respective Commands to develop an overall program plan for the Navy.

Strong and consistent government support for IR&D program planning is considered critical for its success.

DISCUSSION TOPIC NUMBER 3

SPECIFICATIONS AND REQUIREMENTS (TAILORING AND STATEMENTS OF WORK)

Specifications and Statements of Work are the means for identifying Navy requirements to industry. Consequently, these documents can have significant impact on program factors. Authority already exists by virtue of DODI 5000.2 and DODD 4120.21 to "tailor" requirements to individual programs thus introducing a measure of realism into them. This appears to be a practical approach to resolving some of the cost and schedule difficulties. It is difficult to grasp how thoroughly this discipline has permeated the system. Together, Navy and Industry should review any significant progress experienced to date and explore ways to capitalize on this flexibility.

NAVY INTRODUCTORY STATEMENT

DOD directive 4120.21 governing the tailoring of specifications was issued in April 1977. Specifications deviations to most specs are minor and are usually done without difficulty. The Navy does look at specs and requirements that will drive up the costs unnecessarily. But the Navy does not have enough people to completely tailor specifications. Congress has to be shown that specifications and requirements can be enforced.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

NAVY POSITION

Navy maintains that DoD has over-specified for years. The first step is to have a set of realistic requirements from OPNAV (NDCP is a key document). For a "contract" (understanding between OPNAV and NAVMAT) between CNO/CNM, the specs (CDRL/SOW/, etc.) can then be tailored. A Navy board has been established to look for unnecessary specs which would drive up costs. A record is maintained of tailoring action for use in future programs. Contracts are consistently reviewed for legality and clarity. The Navy maintains that if industry contends that it is performing wasteful actions relating to unnecessary specs, then Navy needs more feedback. The message is that the tailoring process has begun and that industry should tell the Navy what else is required of it.

The TAAF (Test, Analyze, and Fix) approach seems to work but it is difficult to implement in the case of hi-rel programs.

Specifications and requirements have been overly emphasized in the past and clearer sets of requirements are needed which means better contact between the CNO and the Commands. Then, a signed Navy Decision Paper is required to provide a SOW, and the basis for a contract between Navy and Industry. This would enable Navy to look at specs and requirements that drive costs up unnecessarily, outline prospective tailoring actions to industry, and explain how tailoring works, in order to get a better bid package.

Congress has to be shown that specifications, as modified, can be enforced and that the government is in control before Congress authorizes payment of the bill.

INDUSTRY POSITION

Industry expressed disappointment on the lack of progress in the specifications and requirements area. Some tailoring has been successful but specifics seem to slow things down and specifications emphasis decreases flexibilities. DoD and industry need to discuss the matter of flexibility realistically. Too much money is spent on specification stipulations. Instead, there should be test and analysis, and the correction of deficiencies.

Industry representatives recommended that the Navy consider qualifying companies once a year instead of qualifying them for each major procurement. Many specifications are out of date and there are too many of them incorporated in contracts.

Industry is also disappointed in the implementation of 4120.21 - things are still too overly structured. Specifications are often included by inference/reference and, consequently, cannot be tailored. Flexibilities are needed in order to be able to negotiate on a continuing basis. There is no incentive to deviate from a specification in order to improve the product. However, it was admitted that specifications that tend to work well on a hi-rel program tend to be proliferated unnecessarily.

The government should be urged to approve company specs/standards where appropriate and enable a company to use them on all government contracts obtained by the company. Warranty data were cited as examples of wastefulness in time and cost.

Every tailoring action is a waiver or deviation and government employees must be conditioned to expect changes in specifications as an acceptable process.

RECOMMENDATIONS

It was agreed that government must be conditioned to accept changes in specifications as this would have the effect of eliminating bad elements from a program. The Navy attitude is that this issue should be elevated to senior Navy management and OSD for consideration.

Changes in specifications can usually be done without difficulty, but there is no incentive for a person on the production line to make changes when required; in fact, such effort is paralyzed.

We don't separate performance requirements from the contractual instrument sufficiently. Companies with good performance records should be favored for contracts.

In summary, the attendees strongly urged elimination of some specifications and most agreed that tailoring specifications is good policy.

DISCUSSION TOPIC NUMBER 4

PRODUCTION INTERRUPTION

NAVY INTRODUCTORY STATEMENT

The focus of the presenter's comments was the loss of learning within 9 to 12 months created by a production gap, regardless of the weapons system. The Navy is currently conducting a study of this problem and has requested inputs from industry to build a case. The major consequence of a production gap is the loss of the vendor base. Navy programs studied to date include the Mark 46 Torpedo, HARM and SHRIKE. The Navy is informing Congress of the problems created through program gaps, instability, increased cost of learning, and the loss of engineering and manufacturing bases.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

The Navy is telling Congress about the need of stability in multi-year contracting so as to prevent gaps in the program attributable to fiscal causes. Comptroller policy and resultant production gaps—slips, gaps, and stops—are intended to save money but don't, partly because of dexterity losses when there are extended interruptions to output. Interruption to output over 9-12 months can lead to a total loss of productivity, including factory personnel, experienced engineers, vendors, etc. This is expected to become more evident as budgets get tighter. This is why there is Navy emphasis on contracting stability along with multi-year contracting to prevent the current fiscally caused gaps in programs.

The White House establishes politically-oriented inflation percentages to be used by federal agencies in budget planning. The comment was made that the new Administration is forecasting lower rates than the Carter Administration, but there was some disbelief that this was happening. Inflation rates should be determined by the real world, not politics. Industry needs to help on this point; Congress agrees, but does not understand inflation as compared to cost growth. The Navy has experienced a 60 percent growth in costs over three years in terms of its commitments and has agreed to fight for a realistic percentage increase or index rise in terms of defense commitments. Whereas the Reagan Administration is using a 7.6% growth rate for inflation for 1982, high technology business is experiencing a 15% to 20% inflation rate.

RECOMMENDATIONS

It was requested that industry provide information and data on loss of learning in order that the Navy could develop more complete records for use with the DoD and the Congress to justify program continuities. Attendees were concerned that inflation is continuing to have an extremely negative effect on programs. Industry representatives suggested the use of a realistic index to reflect cost growth in the defense industry. It was pointed out that the defense industry's inflation index is twice that for the commercial sector.

There is need to report what percentage of the Navy defense budget is competed even though competition does not necessarily reduce costs. Vu-graphs used in this discussion are attached as part of an appendix.

DISCUSSION TOPIC NUMBER 5

EXTENT OF COMPETITION (PRIME/SUBCONTRACTOR)

Congress wants increased competition but the Navy has limited opportunities to increase competition on prime contracts. Yet, prime contractors have substantial opportunity to acquire subcontract material competitively. Because of the lack of data, however, this aspect of competition at the subcontract level has not been used to demonstrate that a significant part of Navy expenditures are indeed competitive.

- What can industry do to capture report data on competition and subcontracting?
- What can industry do to increase subcontract competition?

NAVY INTRODUCTORY STATEMENT

There is a need to find a way to give credit for competition in subcontracting, which implies a new reporting requirement. There is also a need to increase competition with incentives, perhaps in source selection, where past performance should be considered. In fact, the GAO suggests goals and has stated that competition may not always be needed.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

NAVY POSITION

Contractors often say they want competition when what they really want is the contract. The DoD Comptroller interfaces with the Congressional Appropriations Committee members and staff, but they tend to concentrate on cost issues only. A good working team's value should be recognized in contrast to competition in contracts.

There is much pressure to increase competition. Navy has to report on this, since it must determine how to get credit for bringing about subcontractor competition. However, sometimes such competition is not sensible. Companies all have DCAS/AFPRO/NAVPRO and they all have information on subcontractors and vendors. DCAS tends to concentrate on small business information. Some report is needed to counter Congressional pressure to put everything up for competition, even though second/third/fourth tier subcontractors are now less competitive than they used to be.

The OSD Comptroller/Congressional Appropriations Committees working relationship tends to low cost as its principal objective. This interface and relationship often distorts the critical management issues associated with service and defense program interests.

Congress thinks there are no incentives to compete, but what is needed is to obtain 20¢ for each dollar rather than a cost of 11¢ for each dollar of outlays. There

is difference in competition, as between aircraft and ships. Whereas in ships there is true competition, in aircraft Navy generally deals with a sole source.

When you get a team together and it is working well it should be kept going. The interface with committees on the Hill is through accountants who "don't understand the real world." Congress thinks there are no incentives to compete but when those on the Hill think that subcontracting is going into their districts, the push to compete backs off.

INDUSTRY POSITION

Industry reported that it tries to subcontract to an affordable degree but on some contracts or programs, industry cannot afford to qualify more than one subcontractor. Also, the survivability issue is more important to the subcontractors than to the primes. The Navy ought to invest in capital equipment to bring costs down. If industry is also to invest, it must have the incentive to do so.

The prime contractors can provide Navy with data on competition and subcontracting awards since the Navy must report on the percentage of subcontracts awarded from the total Navy R&D procurement account. However, such a procedure might turn into another typical government regulation requiring reams of reports.

There was comment that where a good supplier had done well through R&D, such subcontractors will be maintained as producers. Industry also agreed that contract benefits should be passed along, not just the bad features. The main benefit of multi-year procurement accrues to the supplier base.

Industry members suggested that one place not to have competition was upon completion of development.

DISCUSSION TOPIC NUMBER 6

PRODUCTION CAPABILITY AND MOBILIZATION

The Navy is concerned that inadequate planning is being done by contractors and by the Navy to meet surge and mobilization requirements. The Navy (and DoD) needs to quantify and better specify these requirements to contractors. The Navy perceives the need for contractors to perform more realistic planning which includes second and third tier subcontractors effort. Lack of detailed Navy requirements and lack of funding may contribute to the basic problems associated with this inadequate planning. Navy and Industry should initiate dialogue to consider the problems surrounding Industry's ability to meet surge and mobilization requirements and what advantages are to be realized from a gradual infusion of funds into the budget for this purpose.

NAVY INTRODUCTORY STATEMENT

The Navy is initiating a total change in industrial base planning. By the end of 1981, the DoD expects to find the details of surge capability. The Navy has been tasked to provide inputs to DoD within two weeks of industry's ability to surge on specific programs. Questions being addressed are: Where should funds be placed by industry first? Where do they get the work force and how are they trained? What are the materials and parts availability problems?

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

DoD used to be prohibited from working with industry as regards productivity but this is now changed. There is new interest in surge capacity and constraints on industry. It was pointed out that surge and mobilization are two different subjects: surge is a relatively short time production increase whereas mobilization refers to wartime priorities and long term efforts. There are certain key considerations in all of this. First are stockpiles: what are they and how long will they last? Then, surge limitations, i.e., parts, must be considered. Finally, there is mobilization. What civilian items are dropped to devote additional capacity and production to the military? A comment was made that industry needs cash flow, EPA clauses, etc., in order to invest in plant facilities. Another problem relating to surge/mobilization requirements is the criticality for subcontractors and vendors because of increased competition for their products throughout the economy. What are the limits to their production when all prime contractors wish to double their outputs? The DoD expects to define the details of surge capabilities by the end of 1981.

NAVY POSITION

The Navy has been tasked to provide inputs to DoD within two weeks concerning industry's capability to surge specific programs. Navy was encouraged to develop the initial quick estimate through its Program Management organization. The Maritime Administration is currently paying for a surge capability overview of six shipyards. The plan is due in October 1981.

There is a total change in the industrial base planning program within the Department of Defense. The current thinking presumes that the U.S. can begin to respond within ten days to a demand for a surge capability. Navy has not had the opportunity to discuss or research this issue with industry but plans to direct industry to develop plans and budgets to forecast a surge capability, by program, in the near future. This will involve the planning of requirements against specific DoD program scenarios.

INDUSTRY POSITION

Industry pointed out that funds are required to motivate industry to provide surge capability data and that Navy would have to provide the scenarios. Problems associated with both surge and mobilization efforts affect the common subcontractor in offshore procurements. There are certain key considerations in all of this. Stockpiles—how long will they last? A vendor base will not be available for several years because, in order to create one, producers will have to see long term stability in demand. Cash flow, progress payments, EPA clauses, etc., are needed in order to encourage relevant investments. How would the common foundry, the common aluminum supplier, etc., be handled? Critical production items and capital equipment (such as presses) would not be available and it would take long lead-times to obtain them.

RECOMMENDATIONS

Industry stressed the need for government financing to obtain critical items on a timely basis, to define critical materials in terms of, for instance, 200 basics. There would be a look at the existing stockpiles, determine how long it takes to surge, and what it takes to surge in order to attain mobilization. There are also critical problems to be faced in terms of lead-times for certain industries. Many items are purchased offshore. For example, only three U.S. companies engage in titanium sponge processing and three in producing large forgings. Bottlenecks in these vulnerable sectors as well as others will have to be eliminated well before the onset of a crisis.

The proposal of multi-year funding would be acceptable provided industry is given to understand all elements of financing before it undertakes developing a surge planning capability.

DISCUSSION TOPIC NUMBER 7

MATERIAL LEAD-TIME

The Navy's principal lead-time problems are with electronic components such as integrated circuits and connectors, and with certain types of forgings. Even though lead-times are decreasing somewhat due to lessening of commercial aircraft orders, they are not expected to return to the level we were experiencing in 1977 and 1978. The Navy is concerned that the only real answers are to plan ahead and buy a place in line. Some initiatives are ongoing to aid in early funding and early application of priority ratings with respect to multi-year procurements and follow-on contracts.

NAVY INTRODUCTORY STATEMENT

The general problem areas are: (1) access to critical mineral and materials; (2) industrial capability and its capacity; (3) complexity of production; (4) shifts in demand from military to commercial; (5) the rigidity of military specifications; and finally, (6) emphasis on social pressures from OSHA, EPA, etc. There are administrative problems as well as manufacturing time in critical long-lead items. Furthermore, there are limits in some important industries. Selected vu-graphs used in this presentation can be found in the appendix to these proceedings.

SUMMARY OF NAVY/INDUSTRY DISCUSSION

In 1980, the Defense Science Board indicated that lead-time requirements had increased markedly in the last two years. The problem may be exacerbated if multi-year contracting goes into effect because subcontractors will compete and queue up for scarce items. Also, there is increasing inability to obtain or allocate funds for capital improvements if only because of high interest rates.

There are problems associated with administration and production including a shrinking industrial base, fall-offs in skills, excessive lead-time, the need for obtaining critical components, and increasing dependence on foreign sources.

NAVY POSITION

Navy comments covered problems associated with access to critical minerals and materials; industrial capability/capacity; increasing complexities of production; shifts in demand—military to commercial, rigidities of military specifications, and emphasis on social pressures (OSHA, EPA, etc.).

INDUSTRY POSITION

Industrial attendees stressed that long term procurement commitments would be a major step for improving materials processing and fabrication output potentials. Proper utilization of the defense priority system and adequate stockpiling as well as improved specification and tailoring would also be positive moves. Any decrease in government interfacing would also be helpful and welcomed. At the same time, increased

support of domestic experiments and developments would aid in the overall reduction of the lead-time problem. Other support in terms of developing substitution processes or materials, and improving materials processing and fabrication, was also suggested.

RECOMMENDATIONS

Recommendations were along the general lines stated but it was stressed that if government is willing to support industry financially, industry will be in a position to make specific proposals. Vu-graphs used in this presentation are located in the appendix.

DISCUSSION TOPIC NUMBER 8

PRODUCTIVITY AND MANUFACTURING TECHNOLOGY

The Navy is concerned that U.S. Industry is losing its competitive advantage in certain sectors due to the lack of industry investment in modern capital equipment, lower offshore labor rates, and a perceived lack of quality in domestic products. Some government initiatives are being undertaken to aid such investment by stabilization of defense procurements, shortening of depreciation factors, and lifting of contract termination liability ceilings. We agree with General Slay's statement to the Defense Industrial Base panel that we cannot hope to be a first rate military power with a second rate industrial base.

NAVY INTROUCTORY STATEMENT

Three major sources of productivity growth in the free market are:

- o Technology, representing 59 percent
- o Labor quality, representing 14 percent
- o Capital investment, representing 27 percent

The slump in industry R&D spending has had its effect. Industry's R&D outlays as a percent of real gross national product were 2.05 percent in 1960. In 1979 this had dropped to 1.58 percent. The causes of low quality and production are 85 percent common (faults of the system) and 15 percent special (specific to worker or machine). It is obvious that improvements are needed in the labor force. Better morale will result in better quality. It is possible to use statistics to identify the sources of production problems. At the least, indicators can tell us where to push for productivity improvements.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

A point was made by Industry at the outset that there is a need to put a legislative fence around manufacturing technology funds to achieve more production stability. Along with this, the question was raised regarding the desirability of allocating these funds to program managers as a percentage of their own company's investment in MANTECH. One industrialist questioned the incentive to invest in MT based on the F-16 aircraft experience. General Dynamics invsted \$100 million on top of the Air Force \$25 million investment in this connection in order to build F-16 at the rate of 15 monthly, only to have the government fund an output rate of but 8 per month.

Productivity and Manufacturing Technology are different. Manufacturing technology is an invention by engineers and R&D personnel whereas productivity stems from this, as well as from other sources. If quality is emphasized, productivity will be an automatic by-product. MANTECH funds should be applied to generic improvements; if so, Industry will be serious about MANTECH after DoD funds the program sufficiently.

NAVY POSITION

The Navy plans to invest heavily in MANTECH for shipbuilding though, on the whole, it was said that neither Industry nor Government take MT seriously. MT money has been spent successfully to raise ammunition output because, based on industry opinion, such investment seems to be productive in areas where there are repetitive operations even if output volume is low. Such outlays make it possible to reduce unit costs but MT outlays have not paid off in missiles or in automotive production. MT fund investments are sometimes useful to motivate new processes, and occasionally new hardware is a spinoff.

However, people-motivating programs are not in evidence and fears were expressed lest our continuing losses in productivity result in the demise of Capitalism. Such losses cause breakdowns and neutralize the greatest driving force of productivity which is the prospect for short term gain. Gains have not been in evidence in recent years because the three major sources of productivity growth in the Free Market (Technology (59%), Labor Quality (14%) and Capital Investment (27%)) have lagged. Causes of low quality performance and production are attributed to the extent of 85% to faults in the system and to 15% in terms of specific worker and machine failure factors. The slump in industrial R&D spending is also evident from the fact that industrial R&D outlays declined from 2.05% of GNP in 1960 to only 1.58% of GNP in 1979.

There was some in-house disagreement in Navy regarding "fencing" the funds as it was held that they should stand on their own. It was stressed that Navy obtained only about one-half the Production Enhancement/Capital Investment funds received by the other Services.

Other points made included: more information is needed from Industry on overhead, disincentives versus cost, in the weighted guidelines. The Navy has an MT fund problem in that such funds tend to be raided. Of 16 items in a MARAD study covering deficiencies, 11 had to do with inadequate use or misuse of existing facilities. Advanced procurement would support greater efficiency, and stable programming is needed to encourage industrial investment in company-owned plant facilities. One other area of consideration was how the Navy could change its calculations to write off investments in ways that would help increase the productivity of its engineering force.

INDUSTRY POSITION

Industry agreed that it would be more responsive in the manufacturing area when the Navy and DoD support the concept through funding.

It was advocated there be more computer aided design and manufacturing (CAD/CAM) particularly as industry is also increasingly concerned about the productivity of engineers.

Shipbuilding processes need improvement and there is need to work on advance procurement and long lead-times.

In view of continuing inflation, it was suggested that a single program be picked in ships, aircraft or some other area, and that MT funds be put into it on a multi-year basis so that the money saved could be utilized to defray the difference between

quoted inflation (the 7.6% now being used) and real inflation (which is presently on the order of 13%).

Vu-graphs for this topic can be found in the appendix.

DISCUSSION TOPIC NUMBER 9

MULTI-YEAR CONTRACTING

Navy and Industry support HR745 which proposes increasing the cancellation ceiling, including recurring cost in the ceiling and expanding the concept of advance procurement. We need Industry support in identifying candidate programs for fiscal years 1982 and 1983 and projecting the range of savings to be expected when using multi-year contracting. In order to realize the potential benefits of this effort we must have the cooperation of Industry in the preparation of supporting documentation for the candidate programs and the Navy must also understand the impact on the following areas when multi-year contracting is used.

- Leadtimes
- Logistics Support
- Make/Buy Decisions
- Subcontracting Methods
- Minority Subcontracting

NAVY INTRODUCTORY STATEMENT

There are two major areas involved with multi-year contracting. The first is the environment. We know that national productivity is a concern and that the Reagan Administration is pushing for multi-year procurement. The other area of primary concern is definition. Multi-year contracting covers more than one year and less than five. The total quantity is reflected in the FYDP. We need to budget for each year's requirements. These must be fixed price type contracts with a cancellation ceiling. Multi-year contracting represents a guarantee, but funding is incremental. 62% of industry questioned supports multi-year contracting, 28% did not (they preferred sole source). The remainder was non-committal. Headquarters Naval Air Systems Command identified several programs for multi-year contracting including the ARC-182/R110M for FY 83-86. This would save 14%, or 15 million dollars. Major programs planned for multi-year contracting include VCX, C2/E2, CH-53, and AV8B.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

The Navy is looking into the progress payment issue to determine how much is being carried by Industry. With the new administration and DSB (Defense Science Board) studies, there is a new environment for innovations for contracting and financing and level pricing is contemplated in some cases. The Navy would use multi-year contracting in dealing with OSD and Congress so that program fundings could not be changed. Each program will be looked at on a case-by-case basis. The Navy has identified several major and minor programs for multi-year application and plans to initiate procurement connected with minor programs prior to the 1982 authorization cycle in Congress in order to maximize procurement economies as soon as possible. The major programs can await further refinements after coordination through OSD and, in turn, the Congress.

NAVY POSITION

The Navy is also looking into the area of progress payments to see how much money involved in its contracts is being temporarily financed by industry and to determine what changes are needed in this connection. The DoD program base must be stable. The Navy acknowledged that committing programs to quantity and cost procurements, by year, creates problems for comptroller programming personnel because this would force losses in flexibility.

Chief of Naval Operations is not very keen about multi-year procurement, at the front end of program planning, because it ties its hands to front end commitments in the program cycle. Also, the Navy has reservations about multi-year procurement from the point of termination of liability which can amount to as much as \$100 million per program. While some Navy sectors object to multi-year since it inhibits flexibility of programming and program changes, others contend that MT will add a degree of stability to the system.

HQ NASC has identified several programs for multi-year funding including the ARC-182/R110M, where, during 1983-86, there would be savings of 14% or \$15 million. Other major planned programs include VCX, C2/E2, CH-53 and AV8B.

According to current definitions, multi-year contracting relates to: more than one year but less than five; total quantity for FYDP; budget for each year's requirements; fixed price type contracts; permissible cancellation ceiling; incremental funding and contract guarantees. Lots of cultures have been cracked and new areas can now be explored—the DAR provides for it now. A \$5 million cancellation ceiling is allowed, but is not budgeted by the government.

INDUSTRY POSITION

In response to questioning whether the Navy is moving out ahead of HR-745, it was confirmed to industry that this is so. It was also stressed that Industry needs FP contracts with EPA clauses and emphasized that if the Navy gets involved in the Industrial decision making process, multi-year programming will not work. Further points made were that level funding requires heavy front end costs even with 100% progress payments; that accelerated depreciation should be considered and that the Navy should also consider buying tools and equipment in this connection; that there should be level pricing over time with price caps, and that once the number of units to be produced is established it should never be reduced. Also, designs and performance characteristics for the items involved should remain stable. Vu-graphs used in this presentation are located in the appendix following these proceedings.

DISCUSSION TOPIC NUMBER 10

INDUSTRY INNOVATION REVIEW BOARD

The notion of an Industry Innovation Review Board is based on the idea that current Navy acquisition procedures, policy and constraints may not be conducive to the most efficient methods for developing and buying Navy material. The purpose of this board is to provide a forum for industry to come forward to the Naval Material Command with innovative ideas which have high payoff but may require changes in policy or be a departure from tradition. The board would be comprised of high level Navy Material Command officials and would meet to deliberate Industry ideas on a semi-annual basis or whenever the need so dictated. Before this board is chartered the Executive Roundtable should ratify the notion as reasonable and of value.

NAVY INTRODUCTORY STATEMENT

There is an indication that current policies, procedures and traditions do not necessarily lead to sound business practices. It is suggested that a board be established to review industry's proposed ideas for change.

SUMMARY OF NAVY/INDUSTRY DISCUSSIONS

The Navy is concerned about Industry's overhead and the control processes through various levels. Concern was also expressed about Development and Logistics being placed under one person because it has been found that either the one or the other will be emphasized.

Leadership in Industry and Navy must "blow the whistle early" to identify problems before the bubble bursts. Navy encouraged industry to call senior Navy management when major issues occur because such major issues often cannot be tackled at the contracting officer level.

The Industry Innovation Review Board would be tasked to review Industry's proposals suggesting changes in the way the Navy is currently doing business. Navy encouraged the use of the format for the Senior Executive Roundtable used to address various issues. See appendix for vu-graphs used in this presentation.

GENERAL DISCUSSIONS CONCLUDING THE MEETING

More than 200 studies on the DoD acquisition process have been initiated over the last ten years. Navy has determined that few of the recommendations from these studies have been implemented. Program problems can be traced to inadequate management at some level. One management element which can be addressed is for the Navy to let the contract early in the fiscal year. Three-fourths of the contracts are let in the last half of the fiscal year and 30% in the last quarter. Admiral Whittle said he did not believe the Navy gained so much by lengthy negotiations. Industry needs to blow the whistle on senior Navy management when major problems are developing.

Admiral Whittle found that combining research and development and logistics offices is not effective. An individual either concentrates more heavily on research or on production, one at the expense of the other.

Industry's inputs and thoughts were solicited and welcomed for changes that are being made for improved acquisition procedures. The Navy agreed that the DSARC process must be streamlined with fewer reviews. An average of 50-60 reviews are required prior to initiating the DSARC process.

Attendees generally agreed that the authority or approval process on programs must change. The Assistant and Deputy Assistant Secretariat levels within the process require an excessive amount of time and often are bottlenecks.

Through experience, it has been noted that those program managers informing their bosses of potential detailed problems before they happen, generally have the most effective and professional programs.

Admiral Whittle stated that he plans to visit with OSD and use information from this conference in pushing issues of importance.

Attendees agreed that the front end of the procurement/development cycle needs to be shortened considerably. Admiral Whittle emphasized the need to raise the issue about the low inflation index that DoD is forced to live within, and he plans to bring this to the attention of Senior DoD officials.

A P P E N D I X

V I S U A L S

D I S C U S S I O N T O P I C N U M B E R 1

A-109 CONCEPT

**RELY ON THE PRIVATE SECTOR FOR COMPETITIVE
DEVELOPMENT OF ALTERNATIVE METHODS TO
SATISFY MISSION NEEDS**

FEATURES OF A-109

- RATIONAL POLICY DEVISED BY GOVERNMENT AND INDUSTRY
- EMPHASIZES FRONT END PLANNING
 - NEED ANALYSIS
 - ACQUISITION STRATEGY
- COMPETITIVELY EXPLOITS TECHNICAL RESOURCES OF PRIVATE SECTOR
- FLEXIBLE IMPLEMENTATION OF POLICY IS ENCOURAGED BY DOD

APPROVED NAVY MISSION ELEMENT NEED STATEMENTS

- 1. TACTICAL WAR COMBAT LOGISTICS (COD-VCX)**
- 2. INTERMEDIATE WATER DEPTH MINE (IWD)**
- 3. UNDERGRADUATE PILOT TRAINING (VTXTS)**
- 4. AMPHIBIOUS WARFARE SURFACE ASSAULT (LVT(X))**
- 5. SUBMARINE LAUNCHED ASW STANDOFF WEAPON**
- 6. ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)**
- 7. ADVANCED LIGHTWEIGHT TORPEDO**
- 8. AMPHIBIOUS ASSAULT SURFACE DELIVERY MOBILITY (LCAC)**
- 9. INTEGRATED TACTICAL SURVEILLANCE SYSTEM**
- 10. MARINE VERTICAL ASSAULT TRANSPORT (V/HXM)**
- 11. SUBMARINE ADVANCED COMBAT SYSTEM (SUBACS)**
- 12. SLBM MODERNIZATION**
- 13. DISTRIBUTED STAND OFF AA CAPABILITY**
- 14. MOBILE PROTECTED WEAPON SYSTEM**

"THE DEVIL IS IN THE DETAILS"

- PARALLEL CONTROLLING PROCESSES
ACQUISITION APPROPRIATION
(EVENT CONTROLLED) (CALENDAR CONTROLLED)
- TOO MANY PLAYERS - ALL PLAYING IN THE PROCESS
- PEOPLE DO NOT ALWAYS DO THE RIGHT THINGS AT THE RIGHT TIME
- PEOPLE RESIST CHANGE

SOME PERCEIVED RESULTS

- DEVELOPMENT CYCLE LONGER
- INADEQUATE FRONT END FUNDING
- GOVERNMENT STILL SPECIFIES APPROACH
- PAPERWORK INCREASED - NOT REDUCED

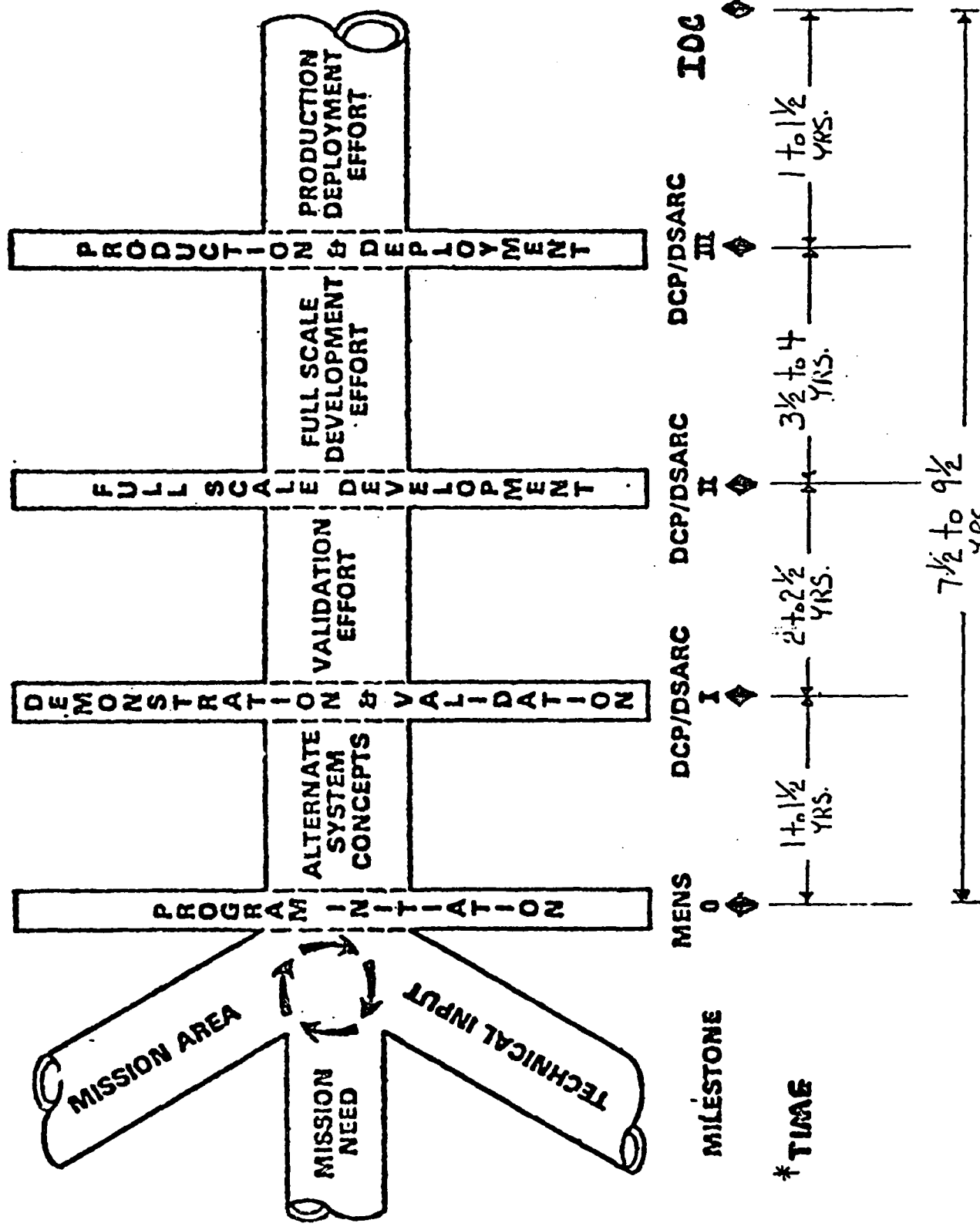
SOURCE FOR CHANGE?

- DEPUTY SECRETARY OF DEFENSE CARLUCCI'S SPECIAL STEERING GROUP NOW REVIEWING ENTIRE PROCESS. LOOKING FOR OPTIONS FOR "IMMEDIATE IMPROVEMENTS".
- REPORT DUE 30 MARCH 1981
- WORKING GROUPS INCLUDE:
 - REDUCING COSTS
 - SHORTENING ACQUISITION TIME
 - REDUCING SUPPORT RESOURCES
 - IMPROVING DSARC PROCESS
 - MULTI-YEAR PROCUREMENT

SOME QUESTIONS FOR DISCUSSION

- **IS A-109 THE BEST APPROACH?**
- **WHAT DOES INDUSTRY WANT TO SEE IN AN RFP FOR AN A-109 PROGRAM?**
- **IF WE KNOW THE SOLUTION IS A PARTICULAR PLATFORM, IS IT WORTH THE EFFORT NOT TO SAY SO?**
- **HOW SHOULD WE CONTROL THE COST OF COMPETITIVE DEVELOPMENT OF CONCEPTS?**

MAJOR SYSTEM ACQUISITION PROCESS



* (RANGE OF TIME SHOWN IS FOR NEW SYSTEMS WITH SIGNIFICANT DEVELOPMENT UNCERTAINTIES; USING SOME CONCURRENCY/TAILORING)

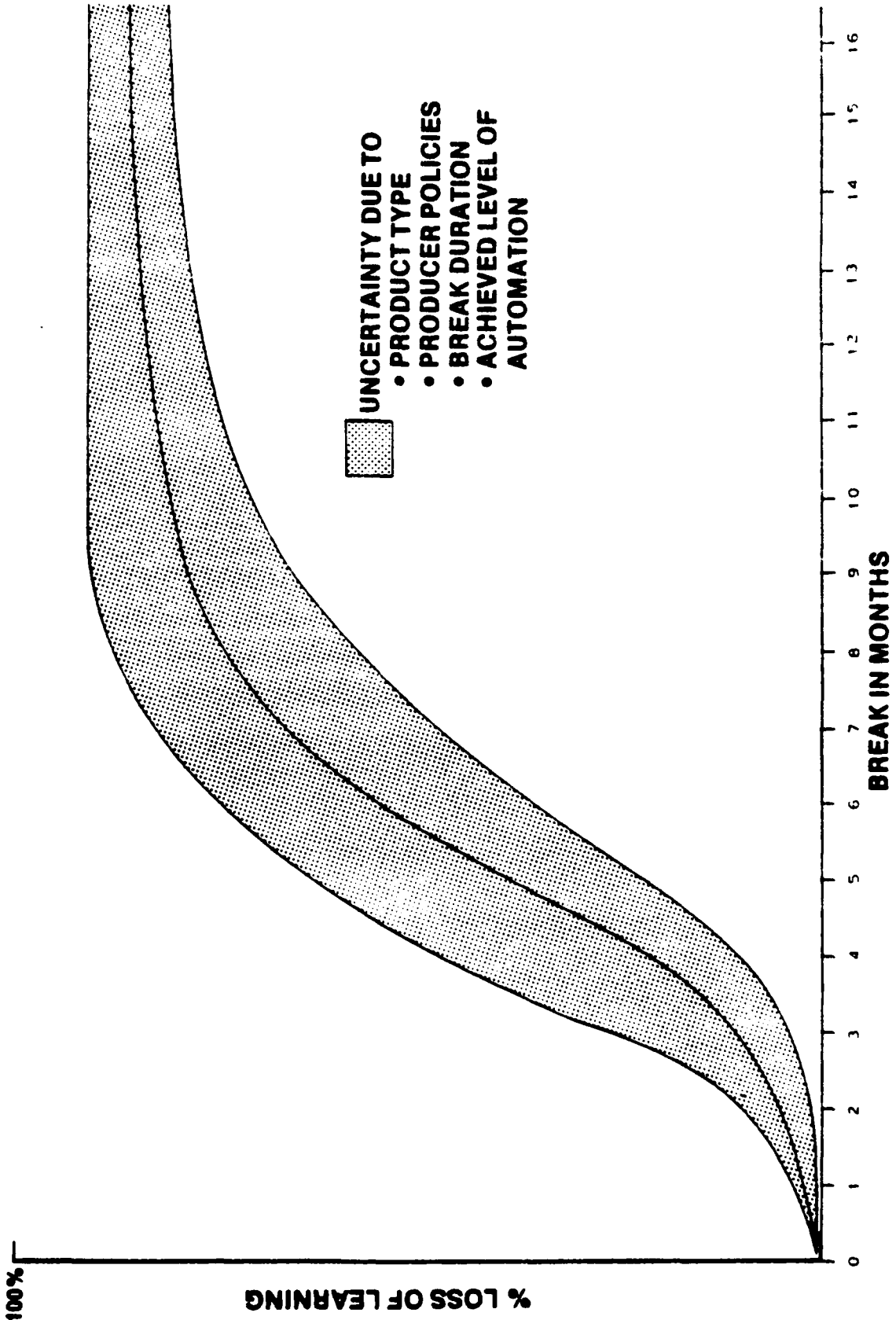
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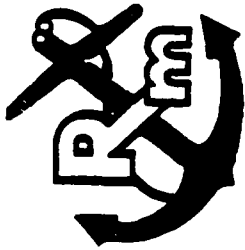
D I S C U S S I O N T O P I C N U M B E R 4

**COMPTROLLERS
ENGINEERS
AND
PRODUCTION GAPS**



LOSS OF LEARNING





LOSS OF LEARNING (LOL)

- LOSS OF FACTORY
 - REDUCTION OF SPACE OCCUPIED
 - FACILITY PLANNING LOSES CREDIBILITY
- LOSS OF EXPERIENCED MANUFACTURING PERSONNEL
 - REASSIGNED
 - PERSONNEL NOT SATISFIED WHEN NOT CHALLENGED
 - FEAR OF LOSING JOB BECAUSE PROGRAM NOT FUNDED
- EXPERIENCED ENGINEERS LOST
 - LOSE IDEAS FOR IMPROVING DESIGN
 - KNOWLEDGE NECESSARY TO EVALUATE TOLERANCE RELAXATION LOST
 - KNOWLEDGE OF NEW VENDOR CAPABILITY LOST
- LOSS OF SMALL SPECIALTY VENDORS
 - CAPACITY PURCHASED BY PROGRAMS WITH \$
 - SMALL BUSINESSES GO OUT OF BUSINESS
 - LARGER SUPPLIER REASSIGNS PERSONNEL
- FABRICATION AND ASSEMBLY METHODS LOSS
 - START UP REQUIRES NEW PERSONNEL TRAINING
 - LOSS OF EXPERIENCE CAUSES REPEAT OF REJECTS
 - TOOLING AND METHODS ITERATION DELAYED
 - TEST LIMITATION LOSS

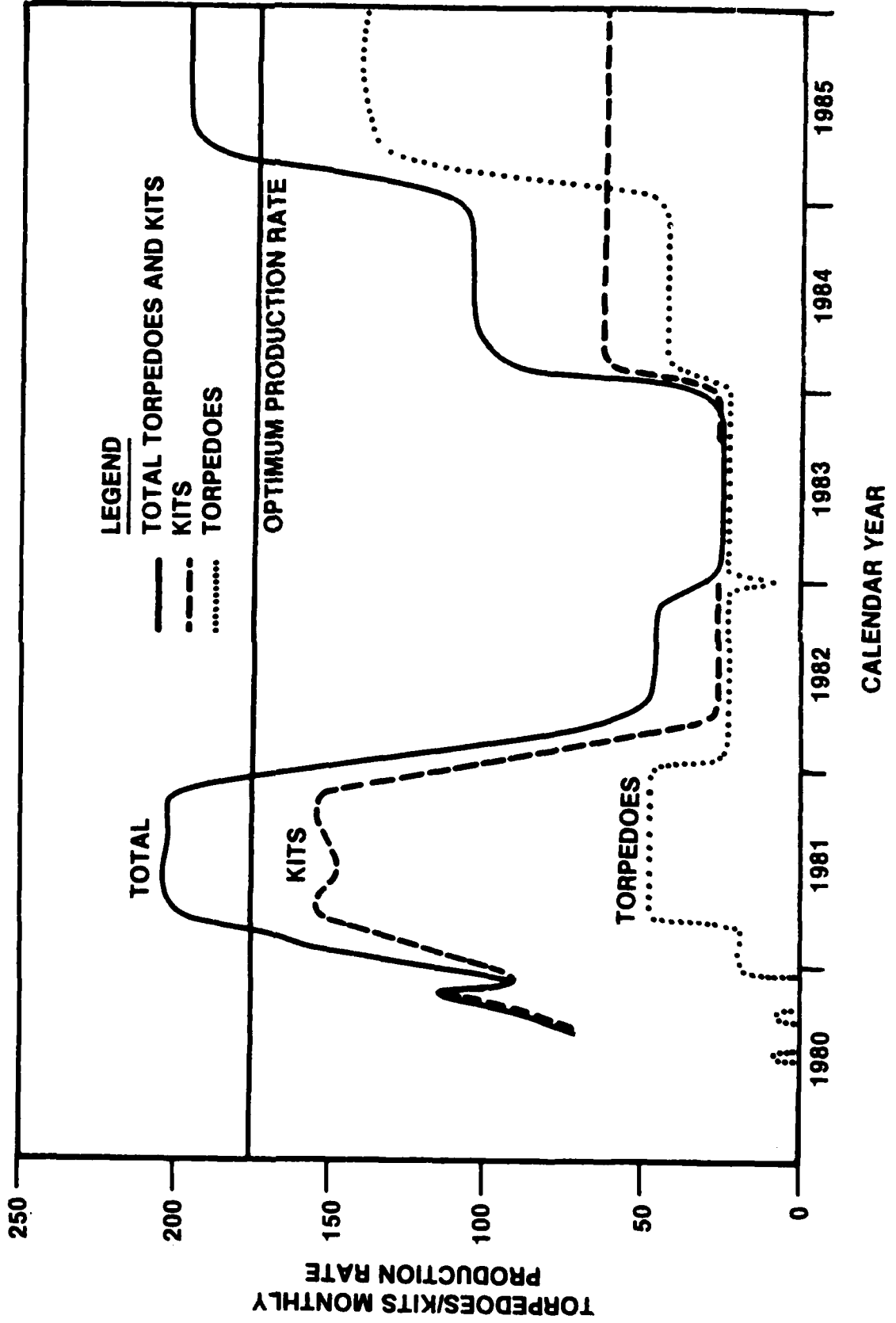
A SIGNIFICANT RESTART EFFORT REQUIRED

SEE REFERENCE:

- 5 ANDERLOHR, GEORGE: WHAT PRODUCTION BREAKS COST. VOL. 1, NO. 9, SEPTEMBER 1969.
- 15 DELIONBACK, LEON M.: A PREDICTION MODEL TO FORECAST THE COST IMPACT FROM A BREAK IN THE PRODUCTION SCHEDULE. GEORGE C. MARSHALL SPACE FLIGHT CENTER, SEPTEMBER, 1977.

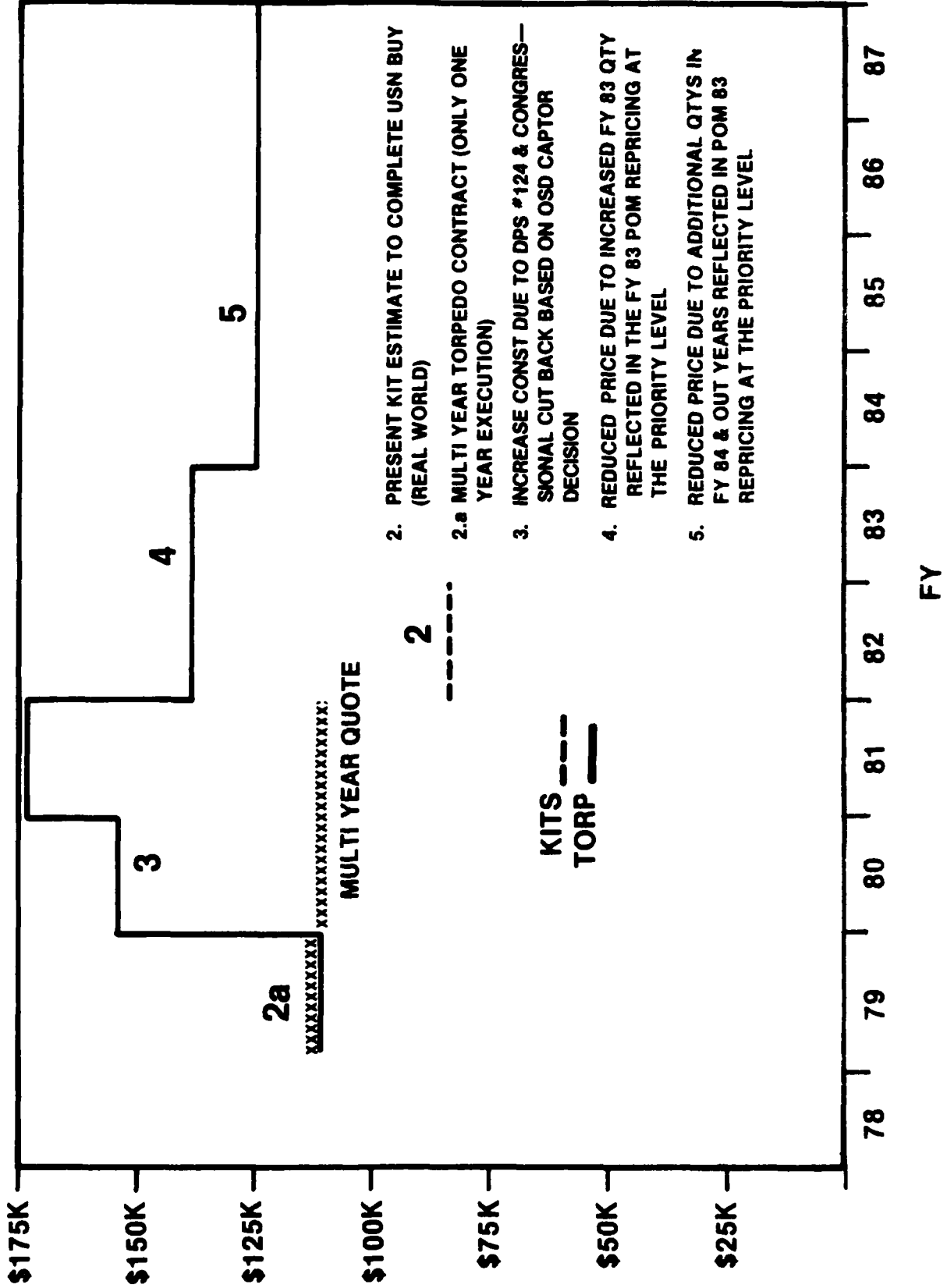


CURRENT PROJECTED PRODUCTION RATE



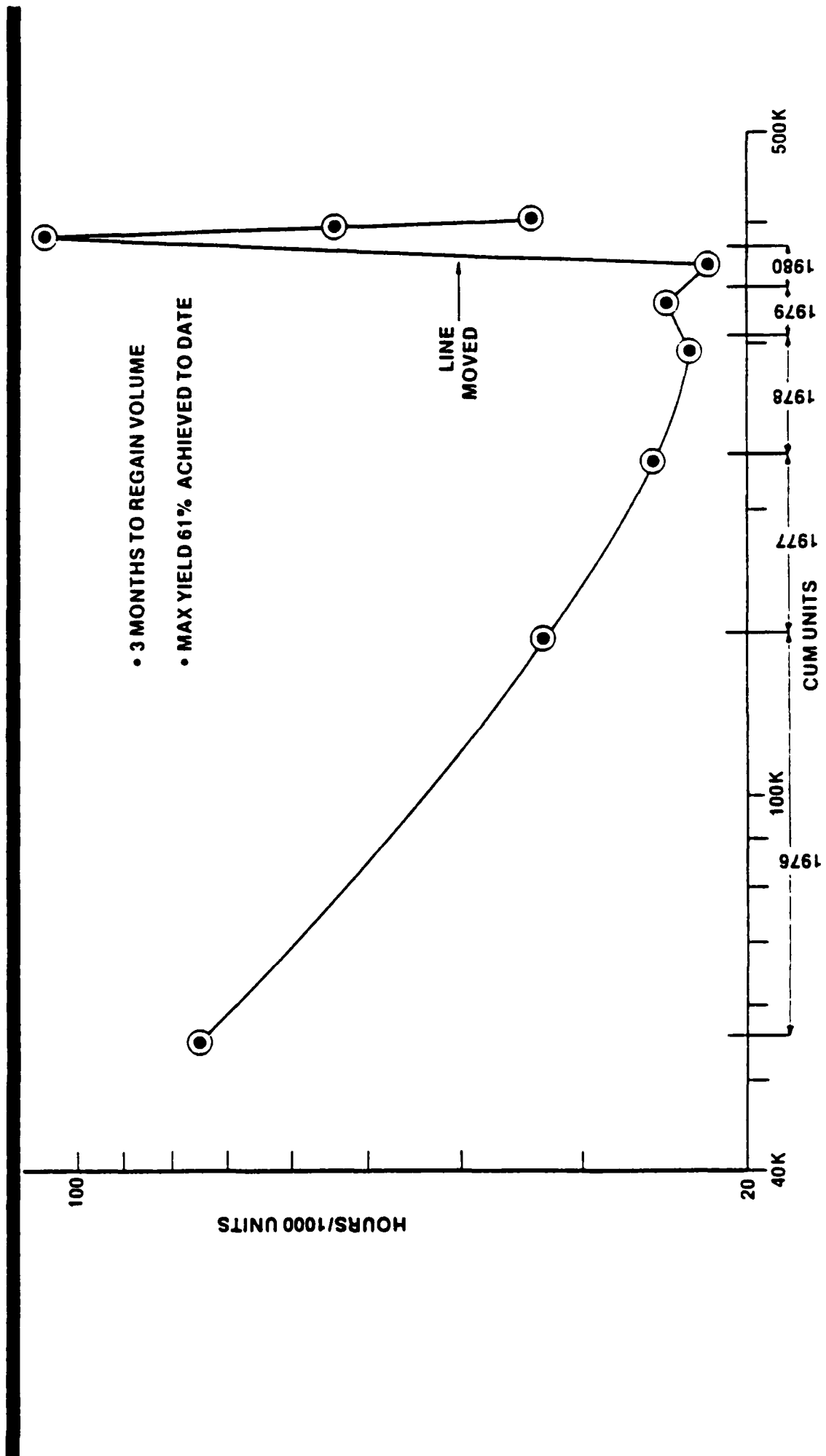


MK 46 MOD 5 PROCUREMENT COST (Constant FY79 \$)



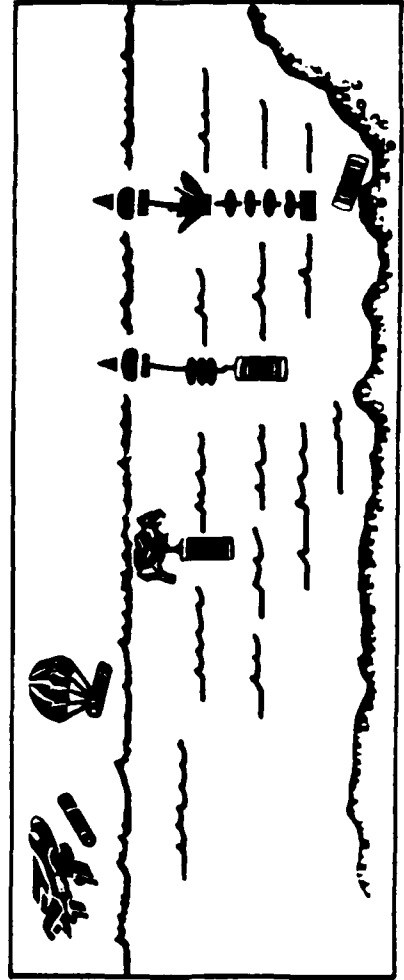
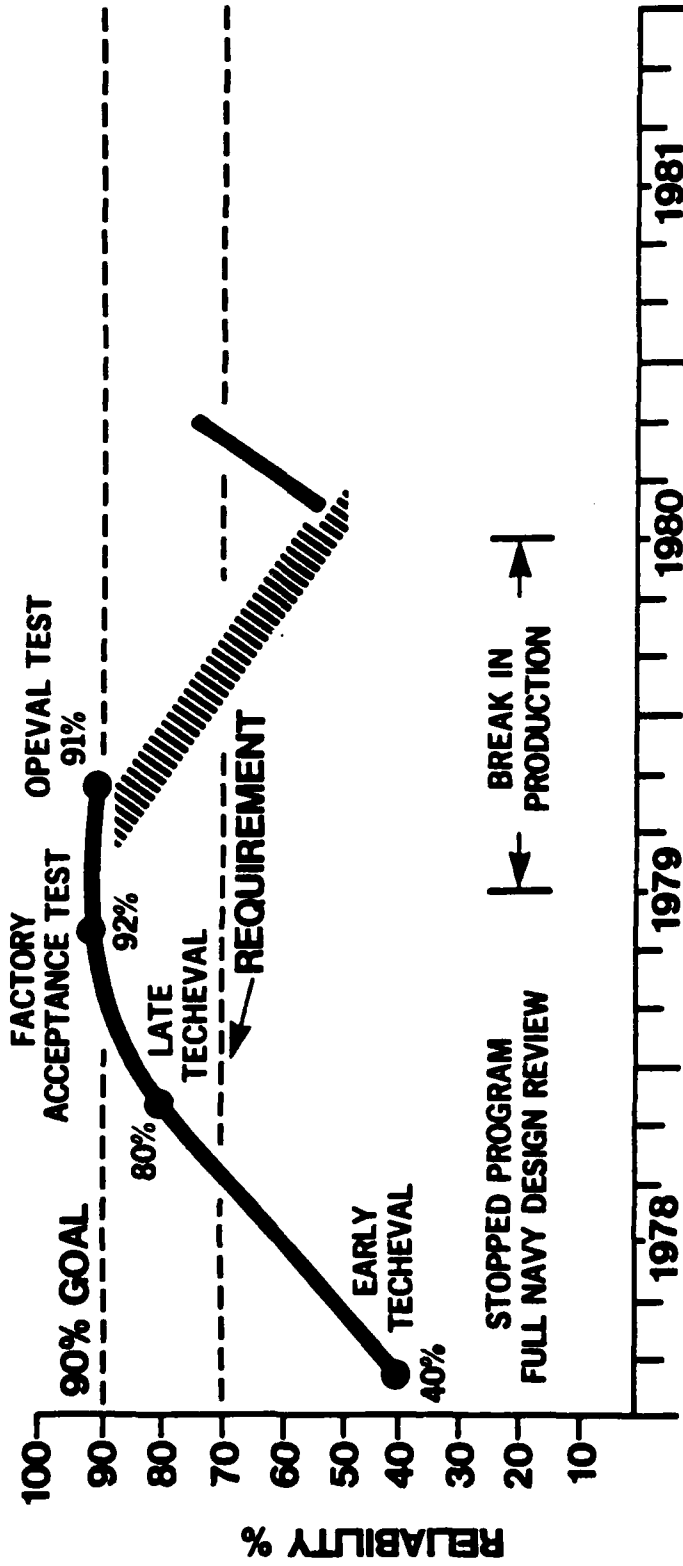


CALCULATOR BATTERY CHARGER PROGRAM IMPACT





VERTICAL LINE ARRAY DIFAR (VLAD) AN/SSQ-77 SONOBUOY



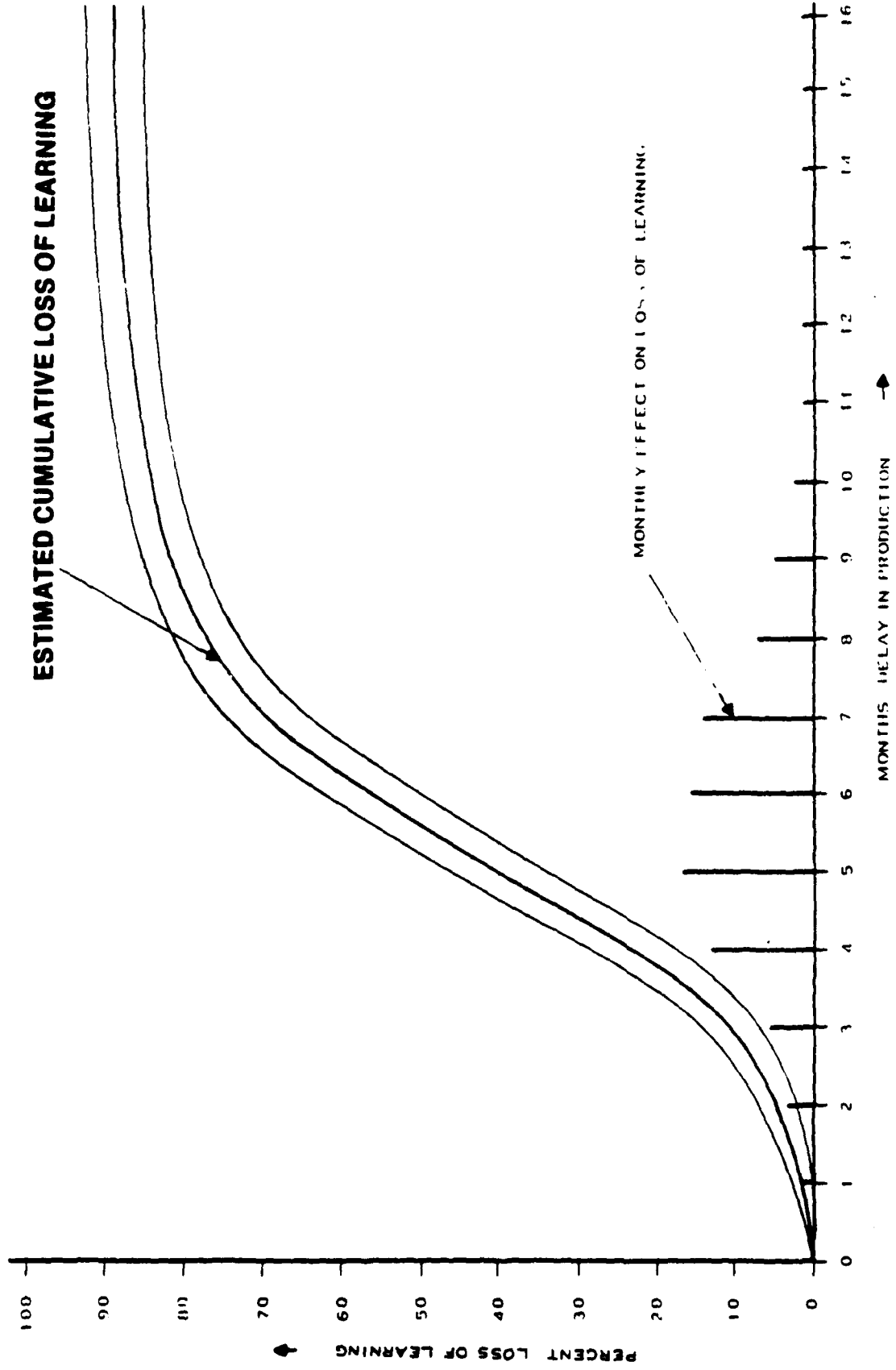


VERTICAL LINE ARRAY DIFAR (VLAD) AN/SSQ-77 SONOBUOY

- PRODUCTION SHUT DOWN FOR APPROXIMATELY 12 MONTHS (MID 79 TO MID 80)
- INDECISION ON CONTINUED PRODUCTION, SECOND SOURCES, PRECLUDED
TIMELY CONTRACTING FOR CONTINUED MANUFACTURE
- PROBLEMS ENCOUNTERED AT RESTART:
 - INITIAL LOTS EXHIBITED HIGH FAILURE RATE
 - VENDORS UNABLE TO DUPLICATE PREVIOUS PRODUCTS
- REASONS FOR PROBLEMS VARIED:
 - OVERCONFIDENCE BASED ON PRE-SHUTDOWN EXPERIENCE
 - UNDERESTIMATION OF "LEARNING" LOSS
 - SOME PROCEDURAL CHANGES - INSPECTION POINTS
 - UNDERESTIMATION OF RESTART-UP COSTS
 - UNAVAILABILITY OF IDENTICAL MATERIALS/PARTS



G, C, W&F PRODUCTION BREAK LENGTH VERSUS LOSS OF LEARNING PERCENTAGE



PRODUCTION GAPS - FALSE ECONOMY

Program stretchouts, slowdowns and gaps in production caused by Navy managers in order to overcome funding shortfalls are costly in every aspect, not only in dollars and reliability but in morale as well. A recent review of one missile program by Mr. W. J. Willoughby, the Deputy Chief of Naval Material for Reliability, Maintainability and Quality Assurance, revealed that the Navy could have saved considerable overall acquisition cost if it had not elected to gap production in order to save money. Major elements of the increased total acquisition costs included: reduced production efficiency and increased rework due to loss of learning; and, continuation of certain overhead costs even if production is at a misery rate, or temporarily stopped. In addition there are marked effects on worker motivation and morale as well as decreased weapon system reliability.

For this actual case the increase in hardware recurring cost over the projected program life was \$23 million in 1978 dollars. The two production gaps could have easily been bridged by continuing missile production over a 16 month period for a total cost of less than \$14 million. The gap should have saved \$14 million due to deferring missile deliveries, instead, a net increase in cost of \$9 million resulted.

For most programs, the increased cost has exceeded any savings, resulting in higher total acquisition costs, fewer units being acquired, and dramatic increase in unit costs.

The Chief of Naval Material is concerned with the effect of gaps because they (1) increase unit cost, (2) reduce productivity, and (3) have adverse impact on worker morale and motivation. During the next year NAVMAT will prepare recommendations and supporting rationale for the purpose of demonstrating the false economy of production gaps. One aim will be to show the advantages of true multi-year funding, another purpose is to identify policy changes which will provide better means for dealing with necessary gaps.

The cost situation is illustrated by Figure 1 which depicts an actual program with two production gaps. The areas marked A represent the increased acquisition costs due to loss of learning and the areas marked B represent the savings due to the gap. This chart shows acquisition costs only and does not include increased logistics costs due to lower reliability and schedule slippages caused by the restarts.

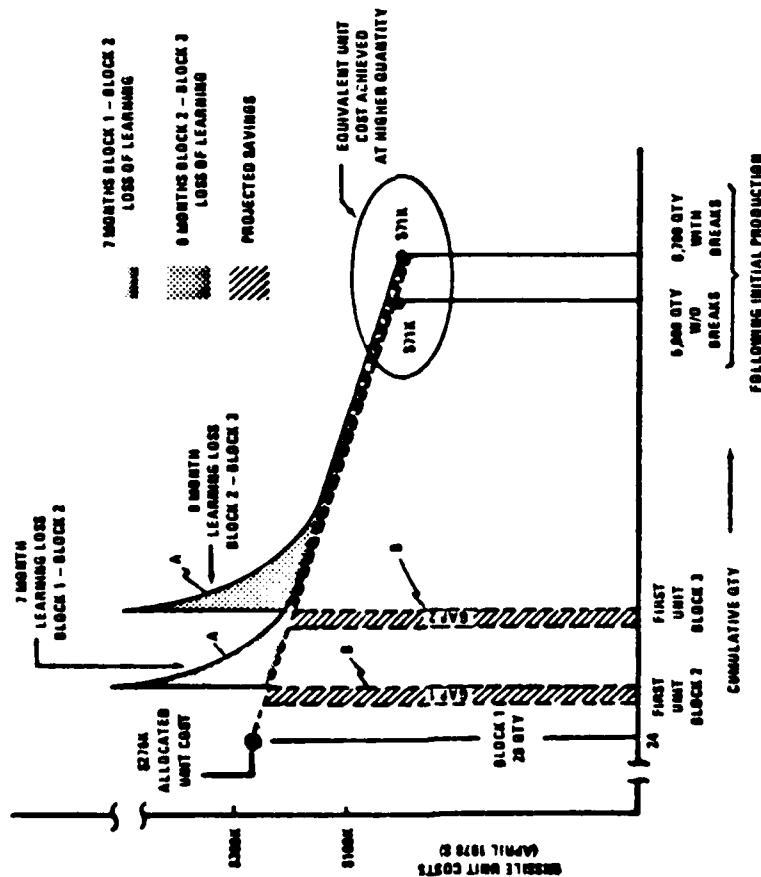
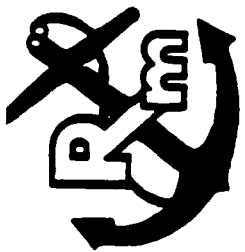
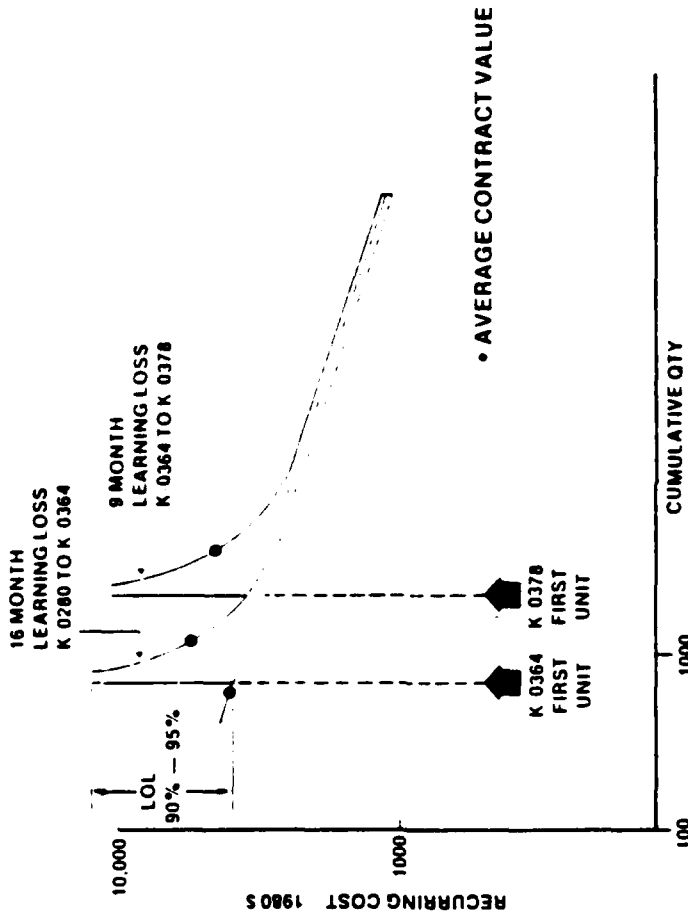


FIGURE 1
Actual Missile Program Learning



SHRIKE CONTROL SECTION PRODUCTION LOL



- AFTER COMPLETING A PRODUCTION RUN OF 270 MK 5 MOD 2 SHRIKE CONTROL SECTIONS A PRODUCTION BREAK OF 16 MONTHS WAS EXPERIENCED.
- FOLLOWING 900 ADDITIONAL UNITS A BREAK OF 9 MONTHS WAS EXPERIENCED
- BOTH BREAKS RESULTED IN A SIGNIFICANT INCREASE IN RECURRING COST AND REDUCTION IN OVERALL HARDWARE QUALITY.



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V I S U A L S

D I S C U S S I O N T O P I C N U M B E R 7

PRIORITY RATINGS

DX/DO DOES:

- GIVE PREFERENCE TO RATED PRODUCTION ORDERS
- CAUSE COMMERCIAL PRODUCTION TO SLIP WHEN CAPACITY IS NOT SUFFICIENT TO SUPPORT COMMERCIAL AND DEFENSE SCHEDULES

DX/DO DOES NOT:

- SHORTEN NORMAL LEAD TIMES
- ENSURE ON-TIME DELIVERIES

DMS/DPS

PURPOSE:

- TO EXERCISE PRIORITY AND ALLOCATION AUTHORITY
- EXPANDABLE IN A NATIONAL EMERGENCY

DEFENSE MATERIALS SYSTEM:

- LIMITED TO CONTROLLED MATERIALS --
(ALUMINUM, COPPER, STEEL, NICKEL ALLOYS)

DEFENSE PRIORITIES SYSTEM:

- FOR ALL OTHER PRODUCTS/MATERIALS

PROCESSED CRITICAL MATERIALS STATUS

"SELLERS MARKET"

- DEMAND OUTRACING SUPPLY
- LARGE PRICE RISES
- GREATLY LENGTHENED LEAD TIMES

CAPACITY PROBLEMS

- FEW INCENTIVES TO EXPAND
- OVER FIFTY FOUNDRIES CLOSED IN LATE 1970'S DUE TO
OSHA/EPA RULE MAKING

ISSUE--MATERIAL LEAD TIMES (EXCESSIVE)

ELEMENTS:

- ADMINISTRATIVE
 - BARRIERS/CONSTRAINTS
 - OVER-REGULATION
 - SPECIFICATION PRACTICES

- PRODUCTION
 - CRITICAL MATERIALS AVAILABILITY
 - MATERIAL PROCESSING
 - FABRICATION CAPACITIES/CAPABILITIES

COROLLARY ISSUES:

- ERODING INDUSTRIAL BASE
- LOW "SURGE" CAPABILITY
 - MOBILIZATION IMPACT(S)
- REDUCED SUPPORT & SUSTAINABILITY OF EFFECTIVE DEFENSE CAPABILITY
- WEAKENING ECONOMY
 - DECREASED ECONOMIC VITALITY

PROBLEMS ARE NATIONAL IN SCOPE

GENERAL PROBLEM STATEMENT

- ACCESS TO CRITICAL MINERALS/MATERIALS
 - DEPENDENCE ON FOREIGN SOURCES
 - INSTABILITY OF SOURCES
 - INADEQUATE STOCKPILE(S)

- INDUSTRIAL CAPACITY/CAPABILITY
 - PROCESSING DEFICIENCIES
 - (E.G. 3 COMPANIES PRODUCE TITANIUM SPONGES,
3 COMPANIES PRODUCE LARGE FORGINGS, ETC.)
 - DISINCENTIVES TO IMPROVE CAPACITIES (E.G., SHORT-TERM
COMMITMENTS)

- COMPLEXITY OF PRODUCTS

- SHIFTS IN DEMAND (MILITARY/DEFENSE → COMMERCIAL)

- RIGIDITY OF MILITARY SPECIFICATIONS

- AMBITIOUS/RIGOROUS IMPLEMENTATION OF "SOCIAL" PROGRAMS
(E.G. OSHA, EPA, ETC.)

CURRENT ENVIRONMENT

- EXCESSIVE LEADTIMES
 - MATERIAL
 - COMPONENTS

- INEFFECTIVE INDUSTRIAL RESPONSE(S) TO MOBILIZATION DEMANDS
 - LIMITED SURGE CAPACITY
 - SHRINKING INDUSTRIAL BASE

- INEFFICIENT SEQUENCING OF "LONG LEAD" ITEMS PROCUREMENTS
(RELATIVE TO WEAPON SYSTEM ACQUISITION PROCESS)
 - T&E GAP
 - CONCURRENCY
 - PREMATURE "PRODUCTION" DECISIONS

- COST IMPACTS
 - ESTIMATING DIFFICULTIES
 - INORDINATE INCREASES

- SCHEDULAR IMPACTS
 - ESTIMATING DIFFICULTIES
 - PROGRAM STRETCHOUTS

DEFENSE SCIENCE BOARD STUDY 1980

<u>RATING</u>	<u>ITEM</u>	<u>LEAD TIME INCREASE (WEEKS)</u>	<u>TIME FRAME</u>
DO	ALUMINUM FORGINGS	20 TO 120	1976 TO 1980
DO	AIRCRAFT LANDING GEAR	52 TO 120	1977 TO 1980
DO	AIRCRAFT ENGINES	86 TO 168	1977 TO 1980
DX	TITANIUM EXTRUSIONS	65 TO 108	1977 TO 1980
DX	INTEGRATED CIRCUITS	25 TO 62	1978 TO 1980

LEAD TIMES (OF BOTH "DO-" AND "DX-" RATED ITEMS) UP SIGNIFICANTLY
FROM 1976 TO 1980 (MOST SIGNIFICANTLY IN THE PAST YEAR)

SOURCE: DEFENSE SCIENCE BOARD 1980 SUMMER STUDY TASK FORCE ON
INDUSTRIAL RESPONSIVENESS SUMMARY BRIEFING 8-15-80

AVERAGE LEAD TIME
(WEEKS)

1978	1980
------	------

TYPICAL A/C PARTS

CAPABILITY

SOURCES

● WYMAN GORDON 2 PRESSES
BULKHEADS, MAIN WING
RIBS, LANDING GEAR
CYLINDERS, ETC.

● ALCOA 2 PRESSES

BULKHEADS,
WING SPARS, ETC.

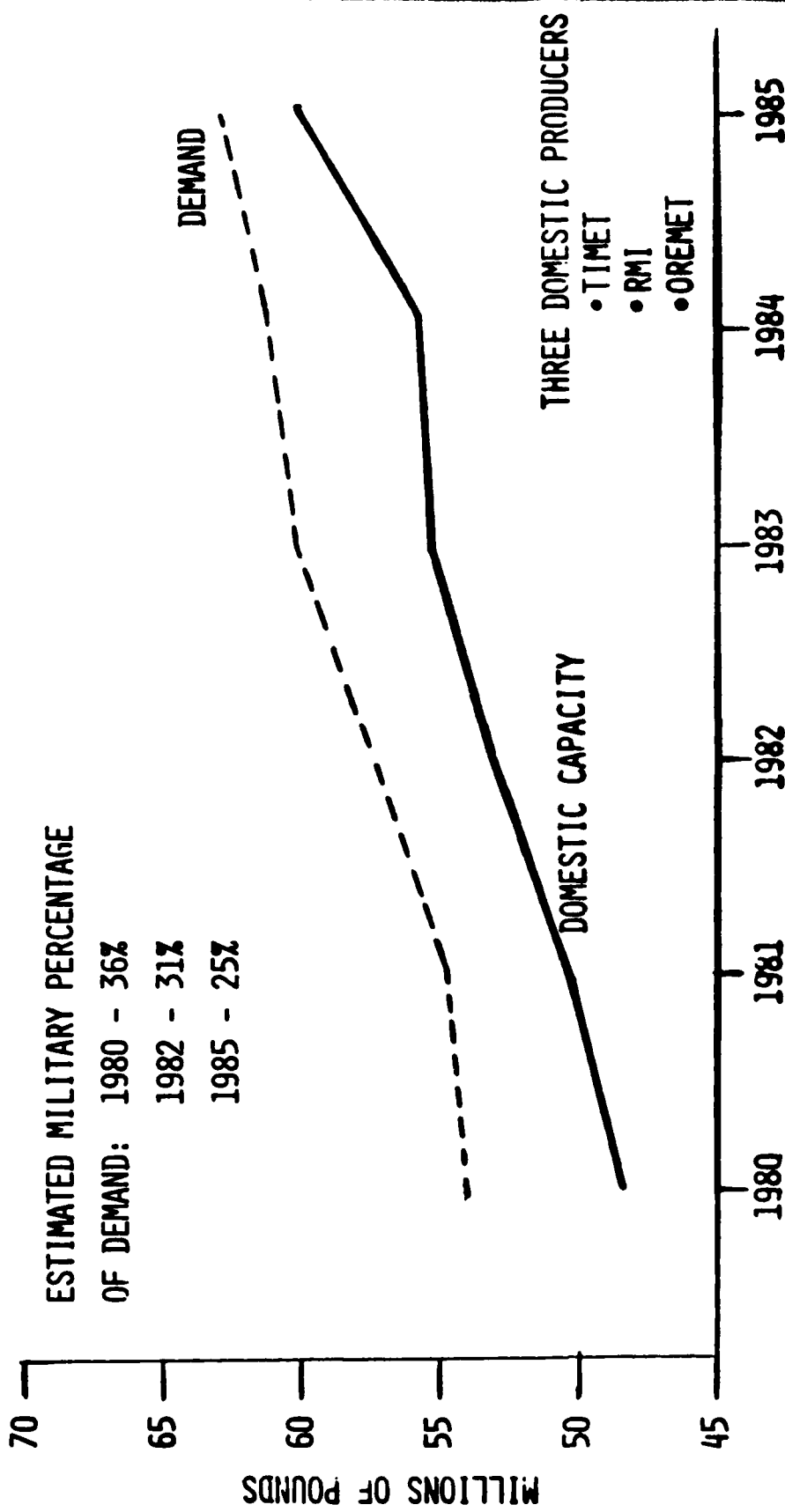
● LADISH 1 HAMMER

ENG COMPRESSOR
DISKS, ETC.

36 (STEEL) 82

30 (TITANIUM) 119

LEAD TIMES-LARGE FORGINGS



ESTIMATED MILITARY PERCENTAGE

OF DEMAND: 1980 - 36%

1982 - 31%

1985 - 25%

DEMAND

DOMESTIC CAPACITY

THREE DOMESTIC PRODUCERS

- TIMET
- RMI
- OREMET

ESTIMATED 1980-85 U.S. SUPPLY AND DEMAND FOR TITANIUM SPONGE

● CAN WE COMPRESS??

● HOW CAN WE ACCOMMODATE MORE EFFECTIVELY/EFFICIENTLY??

● WHERE IS THE POINT OF IRREVERSIBLE ATROPHY (INDUSTRIAL BASE)??

POTENTIAL SOLUTIONS/REMEDIES

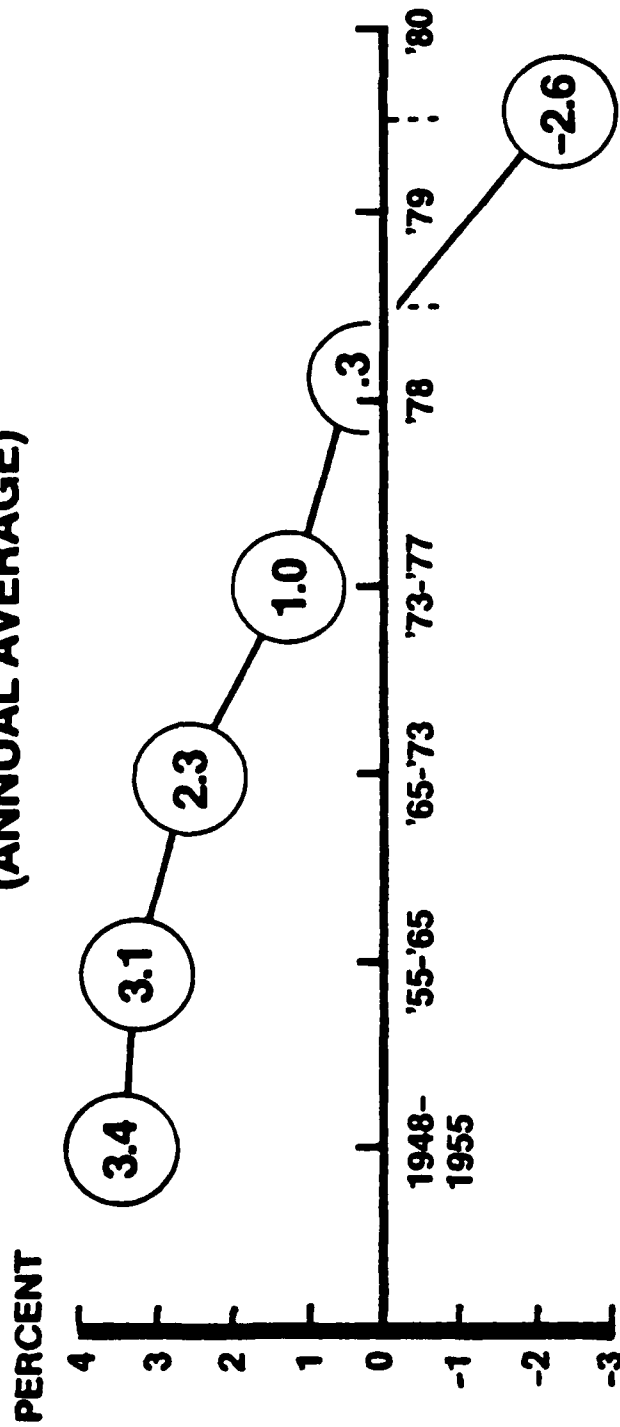
- ENHANCING "TECHNICAL SUBSTITUTION PROCESS" (MATERIALS, COMPONENTS, ETC.)
- LONG-TERM PROCUREMENT COMMITMENTS (E.G., "EXPANDED MULTI-YEAR PROCUREMENTS")
- IMPROVED MATERIAL PROCESSING/FABRICATION
 - MANUFACTURING TECHNOLOGY
 - PRODUCTIVITY ENHANCEMENT
- PROPER UTILIZATION OF DEFENSE PRIORITY SYSTEM (DPS)/DEFENSE MATERIAL SYSTEM (DMS)
 - CONSISTENCY
 - DISCIPLINE
 - EDUCATION
- RELAXATION OF CERTAIN SOCIAL PROGRAM IMPERATIVES (E.G., OSHA, EPA REQUIREMENTS)
- ADEQUATE STOCKPILING
 - CRITICAL MATERIALS
 - CRITICAL COMPONENTS/ASSEMBLIES/ITEMS
- IMPROVED SPECIFICATION TAILORING
- DECREASED GOVERNMENT INTERFERENCE
- INCREASED SUPPORT OF DOMESTIC EXPLORATION & DEVELOPMENT

V I S U A L S

D I S C U S S I O N T O P I C N U M B E R 8

A SAG THAT HAS ECONOMISTS WORRIED

GROWTH IN PRODUCTIVITY IN U.S.
(ANNUAL AVERAGE)

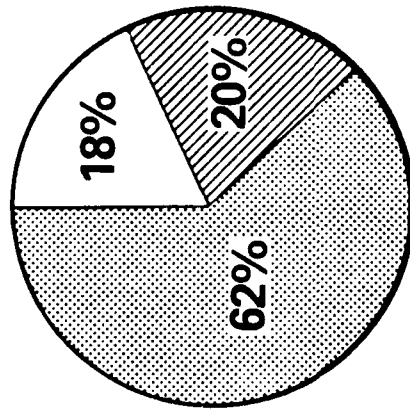


SOURCE: U.S. DEPT. OF COMMERCE

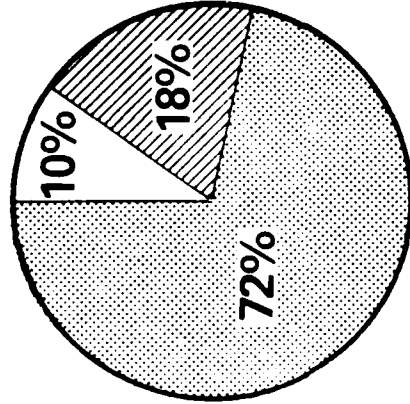


SOURCES OF PRODUCTIVITY GROWTH

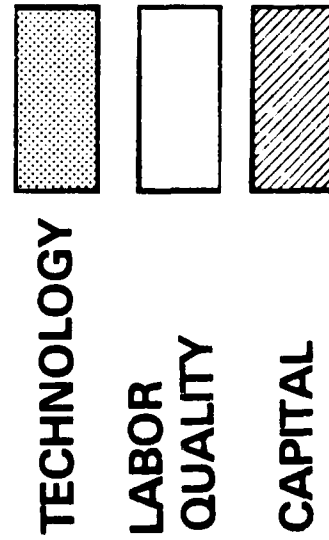
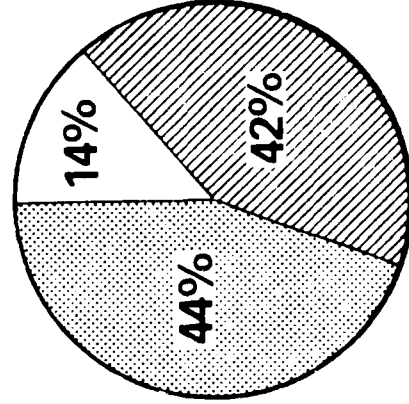
DENISON



KENDRICK

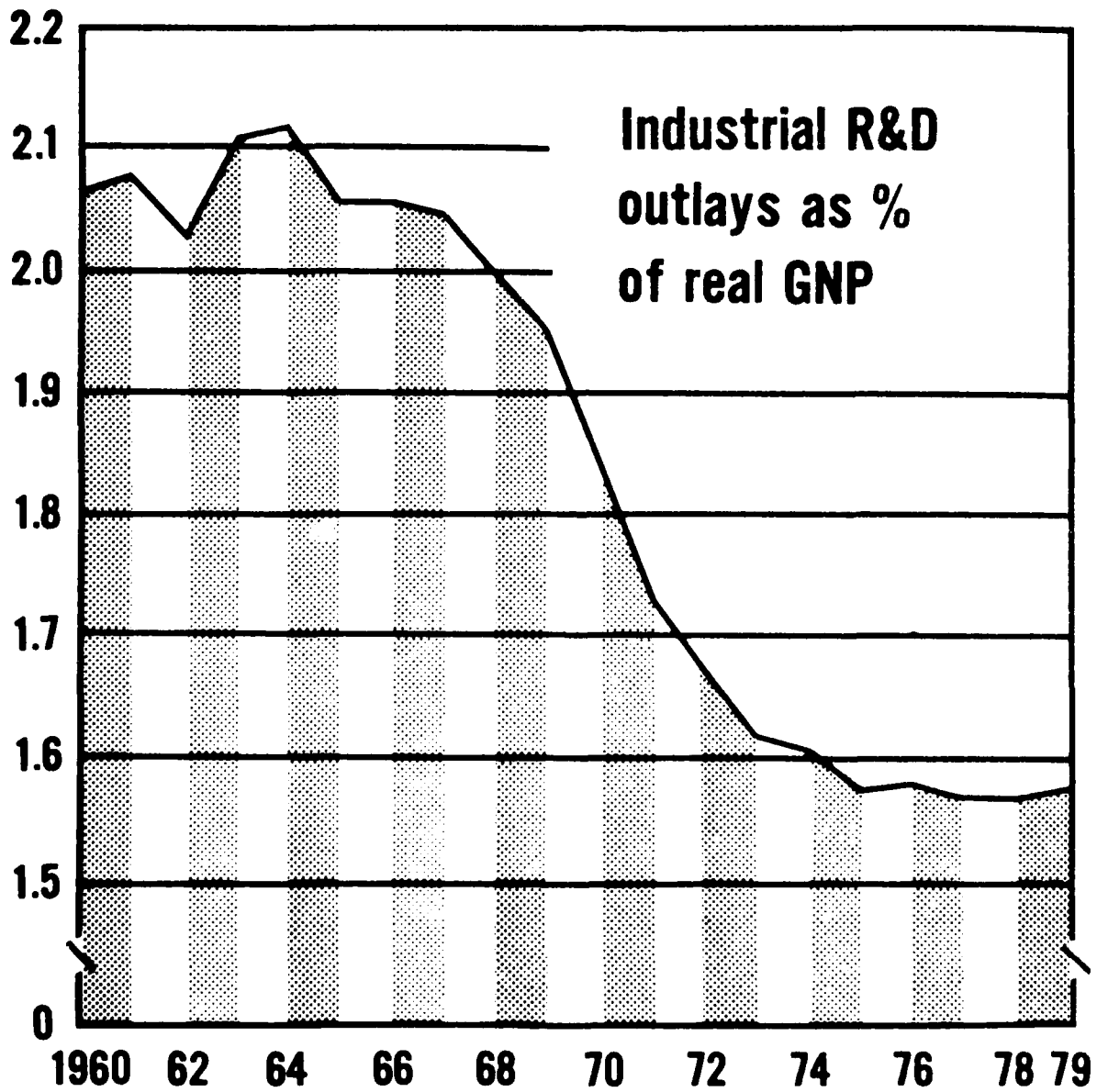


CHISTENSEN & JORGENSEN

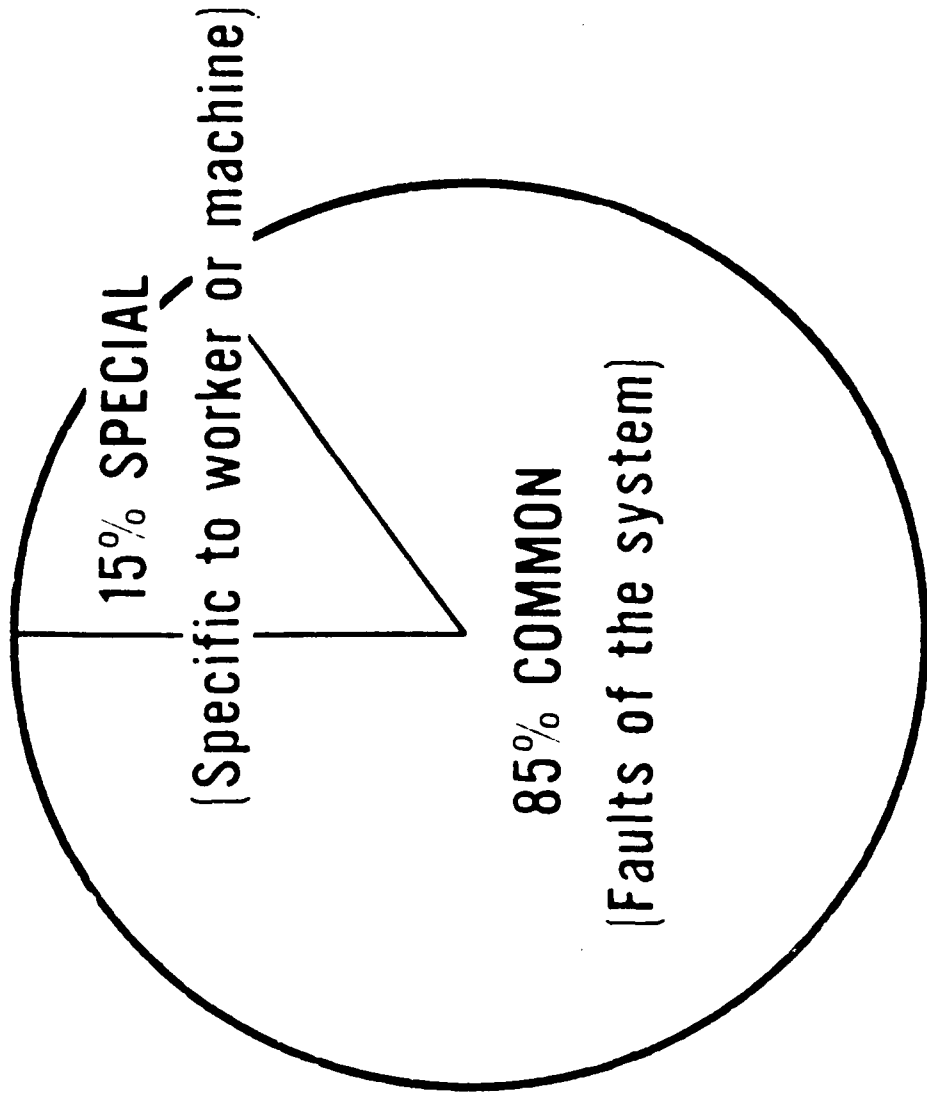


THE SLUMP IN INDUSTRIAL R&D SPENDING

Percent



CAUSES OF LOW QUALITY PERFORMANCE AND PRODUCTIVITY



Dr. W. Edwards Deming

PRODUCTIVITY

WHAT ARE THE MOST CRITICAL ISSUES ?

**WHAT ARE THE GREATEST MARGINS OF OPPORTUNITY
FOR SHORT TERM GAIN ?**

LONG TERM ?

**HOW MUCH TECHNOLOGY ? WHAT KIND ?
- WORKFORCE IMPACT / TRAINING**

PROPER ROLL OF MANTECH ?

IS TECHNOLOGY TRANSFER AN ISSUE ?

V I S U A L S

D I S C U S S I O N T O P I C N U M B E R 9

MULTI-YEAR CONTRACTING AND (ECONOMIC PRODUCTION RATES)

ENVIRONMENT

- NATIONAL PRODUCTIVITY CONCERNS
- PRESIDENT REAGAN'S PUSH ON MORE DOLLARS FOR DEFENSE, BUT SMARTER, MORE ECONOMICAL PROCUREMENT
- HOUSE ARMED SERVICES PANEL ON DEFENSE INDUSTRIAL BASE (ICHORD REPORT)
- DEFENSE SCIENCE BOARD

BOTTOM LINE - ENVIRONMENT IS RIPE TO PURSUE NEW IDEAS FOR INCENTIVIZING SMARTER ACQUISITION/CONTRACTING PRACTICES

DEFINITIONS

BASIC MULTI-YEAR CONCEPT

- COVERS MORE THAN ONE YEAR, NO MORE THAN FIVE YEARS
- TOTAL QUANTITIES PER FYDP
- BUDGET FOR EACH YEAR'S REQUIREMENTS
- MUST BE FIXED PRICE TYPE CONTRACT

CANCELLATION CEILING

- REPRESENTS GUARANTEE TO CONTRACTOR FOR HIS FRONT END COSTS
MADE TO ACHIEVE ECONOMICS
- NOT CONGRESSIONALLY FUNDED

DEFINITIONS (CONT'D)

INCREMENTAL FUNDING

- PARTIAL FUNDS FOR AN END ITEM (I. E. DOES NOT FULLY FUND ANNUAL REQUIREMENT)
- USUALLY EMPLOYED TO BUY LABOR AND MATERIAL CONTRIBUTING TO PROTECTION OF A DELIVERY DATE, OR FUNDING OF R&D EFFORTS

EXPANDED MULTI-YEAR

- FORM OF MULTI-YEAR CONTRACTING
- FUNDING METHODS EMPLOYED TO TAKE ECONOMIC ADVANTAGE OF SCALE AND STABILITY
- H. R. 745 OFFERS OPPORTUNITY TO USE

H. R. 745 PROVISIONS

PURPOSE

- ESTABLISHES POLICY FOR MORE EFFICIENT AND FLEXIBLE CONTRACTING/
FINANCING PROCEDURES
- TO ENHANCE DEFENSE PRODUCTION CAPABILITY

WHEN TO BE USED

- WILL PROMOTE NATIONAL SCURITY AND REDUCE COSTS
- MULTI-YEAR QUANTITIES IN CONSONANCE WITH CONTINUING REQUIREMENT
PER CURRENT PLANS
- LOW CANCELLATION RISK
- STABLE DESIGN/LOW TECHNICAL RISK

H. R. 745 PROVISIONS (CONT'D)

PROVISIONS

- CANCELLATION CEILINGS MAY INCLUDE RECURRING AS WELL AS NON-RECURRING
- CANCELLATION CEILINGS BEYOND \$50M REQUIRE 30-DAY NOTIFICATION PERIOD
- PERMITS INCREMENTAL ADVANCE FUNDING TO ACHIEVE ECONOMIC LOT PURCHASES AND PRODUCTION RATES
- SEEKS ECONOMIC PRODUCTION RATE DATA

INDUSTRY RESPONSE (AVIATION/TAC MISSILES)

RESPONSE PROFILE

- 38 RESPONSES
- 28% UNSUPPORTIVE
- 10% NEUTRAL
- 62% FAVORABLE

BENEFITS CITED

- CAPITAL INVESTMENT/IMPROVEMENTS OPPORTUNITIES
- MATERIAL/SUBCONTRACTING COST SAVINGS
- PROGRAM STABILITY
- BETTER COST PERFORMANCE/ECONOMIES OF SCALE
- REDUCED G&A AND OVERHEAD EXPENSES

INDUSTRY RESPONSE (CONT'D)

(AVIATION/TAC MISSILES)

OBSTACLES TO/INGREDIENTS FOR SUCCESS

- EPA/FLEXIBLE PRICING ARRANGEMENTS
- CANCELLATION CEILING (\$5M)/PREMATURE TERMINATION PROTECTION
- STABLE DESIGN
- STABLE REQUIREMENTS/QUANTITIES
- PROFIT CONSIDERATIONS FOR RISK

CURRENT NAVAIR MULTI-YEAR INITIATIVES
(LESS THAN MAJOR SYSTEMS)

<u>PROGRAM</u>	<u>PROGRAM VALUE</u>	<u>MULTI-YEAR TERM</u>	<u>ESTIMATED SAVINGS</u>	<u>% SAVINGS</u>	<u>MAJOR SOURCE OF SAVINGS</u>
- ADVANCED SIGNAL PROCESSOR	\$346.0M	FY 81-85	\$45.0 M	13%	- ECONOMIC ORDERING OF PARTS - PRODUCTIVITY ENHANCEMENT INVESTMENTS
- POET	\$ 61.0M	FY 82-85	\$12.0 M	20%	- ECONOMICAL PRODUCTION RATE - ECONOMIC ORDERING OF PARTS - PRODUCTIVITY ENHANCEMENT INVESTMENTS
- INTEGRATED ACOUSTIC COMMUNICATIONS SYSTEM	\$ 8.5M	FY 81-83	\$ 2.0 M	23%	- ECONOMICAL PRODUCTION RATE - ECONOMIC ORDER OF PARTS
- AN/APX-100 TRANSPONDER	\$ 56.0M	FY 82-86	\$ 9.0 M	16%	- PRODUCTIVITY ENHANCEMENT INVESTMENTS - ECONOMIC ORDERING OF MATERIALS
- AN/ARC-159 RADIO	\$ 10.0M	FY 81-83	\$ 1.5 M	15%	- ECONOMIC ORDERING OF MATERIALS
- AN/ARC-182 RADIO	\$110.0M	FY 83-86	\$15.0 M	14%	- PRODUCTIVITY ENHANCEMENT INVESTMENTS - ECONOMIC ORDERING OF MATERIALS
- AN/ALE-39 CHAFF DISPENSER	\$ 3.0M	FY 81-83	\$.45M	15%	- COMPETITION
- AN/AQA-7 DIFAR	\$ 90.0M	FY 80-83	\$ 9.0 M	10%	- ECONOMIC ORDERING OF MATERIALS
TOTAL	\$684.5M		\$93.9M		

**INITIAL NAVAIR MAJOR SYSTEMS
MYC CANDIDATES FOR POM 83**

- VCX OR C2/E2
- CH-53
- HARPOON
- AV-8B

PROS/CONS OF MULTI-YEAR CONTRACTING

ADVANTAGES

- **SAVINGS/COST REDUCTIONS**
- **INVESTMENT INCENTIVES**
- **PROGRAM STABILITY**
- **IMPROVED BUDGETING CREDIBILITY**
- **IMPROVED PRIME LEVERAGE OVER SECOND AND THIRD TIER CONTRACTORS**

**PROS/CONS
OF
MULTI-YEAR CONTRACTING
(CONT'D)**

DISADVANTAGES

- POSSIBLE FUNDING SHIFTS TO EARLIER YEARS
- LESS FLEXIBILITY OVER MULTI-YEAR QUANTITIES
- FRONT END EFFORT INTENSIVE AND MUST START EARLIER FOR TIMELY BUDGET JUSTIFICATION/CONGRESSIONAL HEARINGS
- POTENTIAL LOSS OF COMPETITIVE/SURGE BASE
- POSSIBLE PROCUREMENT OF OBSOLESCEENT MATERIALS/COMPONENTS
- POSSIBLE AGGRAVATION OF CURRENT LEAD TIME/BOTTLENECK PROBLEM

THINGS TO CONSIDER ABOUT MULTI-YEAR

- CANCELLATION CEILINGS
- PPBS CYCLE
- DEMONSTRATED SAVINGS
- GOVERNMENT REVIEW OF MATERIAL PROCUREMENT DECISIONS
- VARIABLE QUANTITY PRICING
- PROJECTED PROGRAM PERFORMANCE CHANGES
- SOLE SOURCE PRODUCERS - COOPERATION
- COST RISKS TO CONTRACTORS

V I S U A L S

D I S C U S S I O N T O P I C N U M B E R 10

I N D U S T R Y I N N O V A T I O N

R E V I E W B O A R D

P R E S E N T E R
J O E G R O S S O N

CURRENT POLICIES, PROCEDURES AND TRADITIONS MAY NOT RESULT

IN THE BEST BUSINESS MANAGEMENT ENVIRONMENT FOR THE NAVY

AND THEREFORE HIGH PAYOFF OPPORTUNITIES FOR BOTH INDUSTRY AND

NAVY MAY NOT BE REALIZED.

HOWEVER, THERE DOESN'T APPEAR TO BE A STRUCTURED MECHANISM

IN PLACE FOR INDUSTRY TO COME FORWARD WITH NEW IDEAS THAT

ARE OUT OF THE NORMAL MAINSTREAM OF DOING BUSINESS.

INDUSTRY DOES THIS IN AN AD HOC FASHION, AT PRESENT THROUGH

- CONFERENCES
- ONE ON ONE MEETINGS WITH A VARIETY OF GOVERNMENT OFFICIALS
- THROUGH INDUSTRY ASSOCIATIONS
- LOBBYING WITH OSD AND CONGRESSIONAL STAFF

IT IS PROPOSED TO CHARTER A BOARD OF NAVY OFFICIALS AS FOLLOWS:

NAVMAT HQ - FINANCIAL MANAGEMENT (MAT 01)
 ACQUISITION (MAT 08)
 LOGISTICS MANAGEMENT (MAT 04)
 R&M (MAT 06)

FULL MEMBERS
 SYSCOM ACQ OFFICIALS - NAVSEA (SEA 90)
 NAVAIR (AIR 05)
 NAVELEX (ELEX 08)

LEGAL - OGC

CONTRACTS - MAT 08C

SYS ENGINEERING - MAT 08D

TECHNOLOGY - MAT 07

ACQ - LOGISTICS - MAT 042

R&D CENTERS - MAT 08L

FMS - MAT 08F

ASSTSECNAV - (MRAL) & (RES)

ASSOCIATE MEMBERS

THE BOARD'S FUNCTION WOULD BE TO :

- MEET ABOUT EVERY SIX MONTHS, TO
- REVIEW AND DISCUSS INDUSTRY (NOT ORGANIC NAVY) PROPOSALS TO DO BUSINESS IN A DIFFERENT, MORE SENSIBLE FASHION.
- TO RECOMMEND COURSES OF ACTION TO THE CNM,
- AND REPORT FINDINGS AND RECOMMENDATIONS BACK TO INDUSTRY.

THE BOARD WOULD NOT SUBSTITUTE FOR:

- CONTRACT APPEALS
- CLAIMS SETTLEMENT
- LABOR MANAGEMENT DISPUTES
- RESOLVING OTHER DISPUTES
- ETC.

PROS

- STRUCTURED FORUM TO ACCELERATE ATTENTION AND FOCUS ON SPECIFIC ISSUES - PIN POINT POTENTIALLY HIGH PAYOFF AREAS.
- CONCENTRATES ATTENTION TO ISSUES AT HIGHEST LEVEL WITHIN NAVMAT.
- HIGHLIGHTS AREAS FOR JLC ATTENTION.

CONS

- POTENTIALLY BIASED VIEW FROM ONE COMPANY OR INDUSTRIAL SEGMENT.
- COULD BE COUNTER PRODUCTIVE VICE CONSTRUCTIVE IF USED AS MEDIUM FOR PUTTING SUBORDINATE COMMANDS ON REPORT, BYPASSING EXISTING PROCEDURES FOR RESOLVING DISPUTES, OR GAMING A SELECTION PROCESS.
- ADMINISTRATION COULD BECOME UNWIELDY.

BASIC ISSUE

- SHOULD NAVMAT PROCEED WITH CHARTERING THE BOARD;
- ARE THERE OTHER ALTERNATIVES ?

NAVMAT-INDUSTRY EXECUTIVE ROUNDTABLE

INDUSTRY ATTENDEES

1. BATH IRON WORKS CORPORATION 207/443-3311
John F. Sullivan, Jr.
Chief Executive Officer and Chairman
700 Washington Street
Bath, Maine 04530
2. THE BOEING COMPANY 206/773-3933
Dr. Robert L. Brock
Vice President
Boeing Aerospace Company
P.O. Box 3707 - MS 84-70
Seattle, Washington 98124
3. CONTROL DATA CORPORATION 612/853-5355
John W. Lacey
President, Information & Education
Systems Company
P.O. Box 0
Minneapolis, Minnesota 55440
4. FMC CORPORATION 408/289-2324
Charles H. Johnson
Vice President & General Manager
Defense Equipment Group
P.O. Box 1201
San Jose, California 95108
5. GENERAL DYNAMICS CORPORATION 314/862-2440
Oliver Boileau
President
7733 Forsythe Boulevard
Saint Louis, Missouri 63105
6. GENERAL ELECTRIC COMPANY 215/962-1111
Louis V. Tomasetti
Senior Vice President and Group Executive,
Aerospace Group
Valley Forge Space Center
P.O. Box 8555
Philadelphia, Pennsylvania 19101
7. GOULD INCORPORATED 312/640-4060
James R. Iverson
Vice President
Government Systems Group
10 Gould Center
Rolling Meadows, Illinois 60008

8. GRUMMAN AEROSPACE CORPORATION 516/575-2575
Lawrence M. Mead
Senior Vice President
Departmental Operations
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Bethpage, New York 11714
9. HONEYWELL INCORPORATED 612/870-5175
Warde Wheaton
Vice President and Group Executive
Aerospace & Defense Group
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Minneapolis, Minnesota 55408
10. HUGHES AIRCRAFT COMPANY 213/391-0711
John H. Richardson Ext 6000
President
Hughes Aircraft Company
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11. IBM CORPORATION 301/897-0616
Vincent N. Cook
Vice President
Federal Systems Division
10215 Fernwood Road
Bethesda, Maryland 20034
12. LOCKHEED MISSILES & SPACE COMPANY 408/742-6211
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Robert A. Fuhrman
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P.O. Box 504
Sunnyvale, California 94088
13. MCDONNELL DOUGLAS CORPORATION 314/232-3316
George S. Graff
President
McDonnell Aircraft Company
P.O. Box 516
Saint Louis, Missouri 63166
14. NEWPORT NEWS SHIPBUILDING & DRYDOCK 804/380-4469
COMPANY
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Senior Vice President
4108 Washington Avenue
Newport News, Virginia 23607
15. PETERSON BUILDERS 414/743-5577
Ellsworth Peterson Ext 200
President
101 Pennsylvania Street
Sturgeon Bay, Wisconsin 54235

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PROCEEDINGS OF NATMAT (NAVAL MATERIAL) - INDUSTRY
SENIOR EXECUTIVE ROUNDT. (U) AMERICAN DEFENSE
PREPAREDNESS ASSOCIATION ARLINGTON VA 26 MAR 81

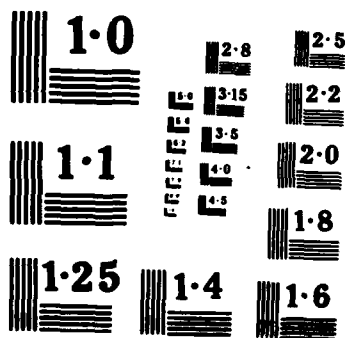
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4108 Washington Avenue
Newport News, Virginia 23607
15. PETERSON BUILDERS 414/743-5577
Ellsworth Peterson Ext 200
President
101 Pennsylvania Street
Sturgeon Bay, Wisconsin 54235

16. RAYTHEON COMPANY 617/862-6600
Dr. Joseph F. Shea
Senior Vice President-Engineering
141 Spring Street
Lexington, Massachusetts 02173
17. RCA CORPORATION 609/755-3301
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Division Vice President and General
Manager
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18. ROCKWELL INTERNATIONAL 214/996-6238
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- 19 SPERRY UNIVAC 612/456-2910
Richard L. Seaberg
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20. TEXAS INSTRUMENTS, INCORPORATED 214/238-4129
Grant Dove
Group Vice President
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21. UNITED TECHNOLOGIES CORPORATION 203/728-7622
Peter L. Scott
Executive Vice President-Electronics Group
United Technologies Building
Hartford, Connecticut 06101
22. WESTINGHOUSE ELECTRIC CORPORATION 301/765-4401
Harry B. Smith
Executive Vice-President
Westinghouse Defense
P.O. Box 1693
Baltimore, Maryland 21203

AMERICAN DEFENSE PREPAREDNESS ASSOCIATION ATTENDEES:

General Henry A. Miley, Jr., USA (Ret)
President

Major General Frank P. Ragano, USA (Ret)
Vice President and Director
Advisory Service

Captain Nelson P. Jackson, USN (Ret.)
Assistant Director
Advisory Service

AMERICAN DEFENSE PREPAREDNESS ASSOCIATION
Suite 900, Rosslyn Center
1700 North Moore Street
Arlington, Virginia 22209
703/522-1820

NAVY/MARINE CORPS ATTENDEES:

1. Admiral A.J. Whittle 202/692-3002
Chief of Naval Material
NAVMAT-OO
Washington, D.C. 20360
2. Rear Admiral J.R. Lewis 202/692-3080
Deputy Chief of Naval Material (Acquisition)
NAVMAT-08
Washington, D.C. 20360
3. Mr. J.F. Grosson 202/692-3081
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