AD-A171 632 A FORMULA FOR ACTION: A REPORT TO THE PRESIDENT ON DEFENSE ACQUISITION(U) BLUE RIBBON COMMISSION ON DEFENSE MANAGEMENT WASHINGTON DC APR 86 1/1

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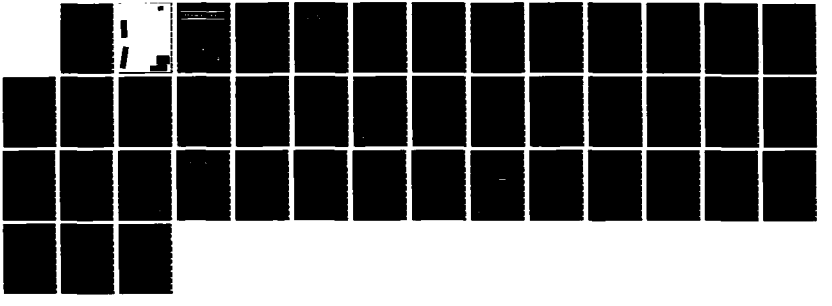

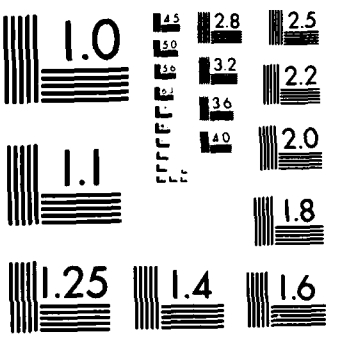

MICROCOPY RESOLUTION TEST CHART

A Formula for Action

A Report to the President on Defense Acquisition

by the President's Blue Ribbon Commission on Defense Management

April 1986

I. Introduction

The President established the Blue Ribbon Commission on Defense Management in part because public confidence in the effectiveness of the defense acquisition system has been shaken by a spate of "horror stories"—overpriced spare parts, test deficiencies, and cost and schedule overruns. Unwelcome at any time, such stories are particularly unsettling when the Administration and Congress are seeking ways to deal with record budget deficits. A major task of this Commission has been to evaluate the defense acquisition system, to determine how it might be improved, and to recommend changes that can lead to the acquisition of military equipment with equal or greater performance but at lower cost and with less delay. For this purpose, the Commission formed an Acquisition Task Force.*

We analyzed the horror stories, as others have done, but concluded that a diagnosis based on recognized deficiencies could lead only to band-aid treatments for a system more fundamentally ill. Therefore, our basic methodology has been deliberately quite different.

We compared the defense acquisition system with other systems, both government and commercial, that develop and produce equipment of comparable complexity, in order to find success stories that could provide a model on which reforms of the defense acquisition system could be based. Defense acquisition represents the largest and, in our judgment, the most important business enterprise in the world. It deserves to be managed with the highest standards. We therefore conducted a "search for excellence" by examining organizations that had been most successful in acquisition, in order to find a model of excellence for defense acquisition.

The major recommendations developed by the Acquisition Task Force were presented in our Interim Report of February 28, 1986. This, the Commission's Report on Defense Acquisition, is intended to provide additional detail and to assist in implementing the recommendations already made.

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*The work of the Task Force was directed by William J. Perry. In addition to David Packard, its members included Louis W. Cabot, Charles J. Pilliod, Jr., R. James Woolsey, and the late Ernest C. Arbuckle.

II. The Scope of the Defense Acquisition System

Defense acquisition is the largest business enterprise in the world. Annual purchases by the Department of Defense (DoD) total almost $170 billion—more than the combined purchases of General Motors, EXXON, and IBM combined. DoD's research and development (R&D) expenditures are more than fifteen times those of France, Germany, or the United Kingdom, and eighty times those of Japan. Defense acquisition involves almost 15 million separate contract actions per year—or an average of 56,000 contract actions every working day.

DoD makes only a small percentage of its equipment. It depends primarily on the nation's industrial companies to develop its weapons and to manufacture everything from belt buckles to aircraft carriers. In general, these companies do not work solely on defense contracts. Most of the top 50 defense contractors also engage in substantial commercial production. Boeing, for example, supplies aircraft both to DoD and to commercial airlines. IBM supplies computers for military and commercial applications. In this way, the technological base developed for commercial products can be effectively applied to military products, and vice versa. On the other hand, this dual commercial-military product base greatly complicates DoD's task of regulating and auditing the technical and financial performance of industry.

DoD employs more than 165,000 people, both civilian and military, to manage this vast array of R&D, procurement, and logistics programs. Nearly all of these people work for the Services, which directly manage these programs subject to the oversight of a relatively small staff in the Office of the Secretary of Defense (OSD). Further oversight is provided by the Executive Office of the President, including the Office of Management and Budget, particularly in connection with the President's defense budget. And the Congress, in exercising its constitutional responsibility to provide for our Armed Forces, authorizes and appropriates funds for each of more than 2,600 specified procurement and R&D line items, and plays a major role in overseeing acquisition programs.

A responsible analysis of problems in the defense acquisition system must take into account the complexity and scope of acquisition programs. A responsible prescription for change must address the actions of everyone who—for better or worse—can influence these programs, from defense contractors and program managers to OSD officials and Members of Congress.

III. Problems with the Present Acquisition System

All of our analysis leads us unequivocally to the conclusion that the defense acquisition system has basic problems that must be correcte ' These problems are deeply entrenched and have developed over several decades from an increasingly bureaucratic and overregulated process. As a result, all too many of our weapon systems cost too much, take too long to develop, and, by the time they are fielded, incorporate obsolete technology.

Recent public attention has focused on cases of spare parts overpricing that have been prominently reported by the media. Many of these cases were uncovered by DoD itself, which has a major effort underway to detect spare parts overpricing and to minimize such problems in the future. By contrast, we have focused on the acquisition of major weapon systems, because improved efficiency there can lead to cost savings greater by orders of magnitude. We nonetheless also analyzed the spare parts cases to determine whether they are indicative of systemic problems and, if so, how these should be addressed. Although each of the cases we examined had its own peculiarities, we identified a number of problems that frequently recurred: for example, government insistence on rigid custom specifications for products, despite the commercial availability of adequate alternative items costing much less; the ordering of spare parts so late in a program, after the close of the production line, that they must be expensively hand tooled; the use of unsuitable cost allocation procedures that grossly distort the price tags of inexpensive spare parts; the buying of spare parts in uneconomically small quantities and hence at higher prices; and the simple exercise of poor judgment by acquisition personnel.

In general, we discovered, these problems were seldom the result of fraud or dishonesty. Rather they were symptomatic of other underlying problems that affect the entire acquisition system. Ironically, actions being prescribed in law and regulation to correct spare parts procurement tend to exacerbate these

underlying problems by making acquisition procedures even more inflexible and by removing whatever motivation exists for the exercise of individual judgment. This Report will concentrate on ways of improving the efficiency of the overall acquisition system. Removing bureaucratic inefficiencies in our acquisition of major weapon systems also will realize significant improvements in our procurement of associated spare parts.

Problems with the present defense acquisition system begin with the establishment of approved "military requirements" for a new weapon, a step that occurs before development starts. Two common methods exist for establishing the need for a new system—"user pull" and "technology push." Both methods are unsatisfactory.

User pull defines the institutional process by which users (notably the Services) assess the adequacy of existing weapons to meet military needs, and state the characteristics of the next generation of equipment desired to overcome identified inadequacies. In general, this process does not adequately involve participants with a sophisticated knowledge of the cost and schedule implications of technical improvements required to satisfy these characteristics. Consequently, user pull often leads to goldplating—that is, the inclusion of features that are desirable but whose cost far exceeds their real value. If users understood the likely impact of their requirements on the schedule, quantity, and maintainability of the weapons they eventually received, they would have strong motivation for compromise. Generally, however, that compromise—a conscious trade-off between performance and cost—does not take place to an adequate degree. Implicitly, it is assumed that military requirements should be "pure," and that any necessary trade-offs will take place later in the process.

Alternatively, requirements often are established by technology push. A government or industry team conceives of a new or advanced technology. It then tries to persuade users to state requirements that will exploit the new technology. Most of the really significant improvements in military technology—radar, jet engines, and the atomic bomb, for example—have occurred by technology push rather than by an abstract statement of requirements. Because participants in this process tend to push technology for its own sake, however, this method is no less prone to result in goldplating than user pull.

Once military requirements are defined, the next step is to assemble a small team whose job is to define a weapon system to meet these requirements, and "market" the system within the government, in order to get funding authorized for its development. Such marketing takes place in a highly competitive environment, which is desirable because we want only the best

ideas to survive and be funded. It is quite clear, however, that this competitive environment for program approval does not encourage realistic estimates of cost and schedule. So, all too often, when a program finally receives budget approval, it embodies not only overstated requirements but also understated costs.

Funding having been approved, the DoD program team is then enlarged and given the task of preparing detailed specifications. Weapon system specifications for a major program typically run to thousands of pages, not counting generic military specifications included by reference. System specifications effectively become a surrogate for overstated military requirements, which tend to fade from view.

DoD then invites industry to bid on the program. The overly detailed system specifications serve as a basis for defense contractors to prepare competitive proposals describing how they would meet the specifications, and at what cost to them and price to the government. The preparation of competitive proposals may very well expose technical problems with the specifications, or reveal modifications that would be cost effective. The environment in which program competition typically takes place, however, encourages improvements *within* specifications, but discourages modifications that *deviate* from specifications. This effectively forecloses one principal factor—trade-offs between performance and cost—on which the competition should be based. The resulting competition, based instead principally on cost, all too often goes to the contractor whose bid is the most optimistic.

In underbidding, contractors assume there will be an opportunity later in a program to negotiate performance trade-offs that make a low bid achievable, or to recover understated costs through engineering change orders. Today, however, most production and many development contracts are negotiated on a firm, fixed-price basis. For the government, the advantages of a fixed-price arrangement, particularly the incentives it creates for realistic bidding, are obvious. The disadvantages to the government, while more subtle, are nevertheless of real concern. Fixed-price contracts effectively can enshrine overstated requirements and understated costs in a legal arrangement that allows little or no flexibility for needed trade-offs between cost and performance. This contractual arrangement, intended to protect the government, may cause both sides to lose.

In the face of these daunting problems, DoD selects a successful bidder and launches the program. The DoD program manager sets out to accomplish the improbable task of managing his overspecified and underfunded program to a successful conclusion.

But what was merely improbable soon becomes impossible. The program manager finds that, far from being the manager of the program, he is merely

one of the participants who can influence it. An army of advocates for special interests descends on the program to ensure that it complies with various standards for military specifications, reliability, maintainability, operability, small and minority business utilization, and competition, to name a few. Each of these advocates can demand that the program manager take or refrain from taking some action, but none of them has any responsibility for the ultimate cost, schedule, or performance of the program.

None of the purposes they advocate is undesirable in itself. In the aggregate, however, they leave the program manager no room to balance their many demands, some of which are in conflict with each other, and most of which are in conflict with the program's cost and schedule objectives. Even more importantly, they produce a diffusion of management responsibility, in which everyone is responsible, and no one is responsible.

Meanwhile, throughout this process, various committees of Congress are involved. During the marketing phase, it is not enough for the program manager to sell the program to his Service leaders and the various staffs in the Office of the Secretary of Defense. He also must sell the program to at least four committees and to numerous subcommittees of Congress, and then resell it for each fiscal year it is considered. In so doing, the program manager is either assisted or opposed by a variety of contractors, each advocating its own views of the program on Capitol Hill. While congressmen have an abstract interest in greater program effectiveness, they also have an intense pragmatic interest in their own constituencies. These two interests are frequently in conflict, as they exert pressure on specific programs through legislative oversight.

All of these pressures, both internal and external to DoD, cause the program manager to spend most of his time briefing his program. In effect, he is reduced to being a supplicant for, rather than a manager of, his program. The resulting huckster psychology does not condition the program manager to search for possible inconsistencies between performance and schedule, on the one hand, and authorized funding, on the other. Predictably, there is a high incidence of cost overruns on major weapon systems programs.

But a much more serious result of this management environment is an unreasonably long acquisition cycle—ten to fifteen years for our major weapon systems. This is a central problem from which most other acquisition problems stem:

- It leads to unnecessarily high costs of development. Time is money, and experience argues that a ten-year acquisition cycle is clearly more expensive than a five-year cycle.
- It leads to obsolete technology in our fielded equipment. We forfeit our five-year technological lead by the time it takes us to get our technology from

the laboratory into the field.

- And it aggravates the very goldplating that is one of its causes. Users, knowing that the equipment to meet their requirements is fifteen years away, make extremely conservative threat estimates. Because long-term forecasts are uncertain at best, users tend to err on the side of overstating the threat.

This description of the acquisition system is stark, but it by no means exaggerates the environment of many, if not most, defense programs. Given this pernicious set of underlying problems, it is a tribute to the dedication of many professionals in the system, both in and out of DoD, that more programs do not end up in serious trouble.

IV. An Acquisition Model to Emulate

Problems attendant to defense acquisition are not new, nor are such problems unique to DoD. Rather, they are typical of the way in which large bureaucracies, particularly government bureaucracies, manage large, complex projects. With this in mind, we compared how other large institutions have managed programs of similar complexity—that is, multi-year, multi-billion dollar programs incorporating state-of-the-art technology.

Two recent efforts have been made to draw such a comparison (see Appendix A). Notably, average cost growth in major defense programs has been found to be less than that experienced by many comparable civil programs, including highway projects, water projects, public buildings, and large processing plants. The good news from these studies is that DoD is no worse than other large bureaucratic organizations in managing major programs.

This leaves unanswered, however, what level of excellence can be achieved in defense programs. To answer this question, a landmark study was undertaken by the Defense Science Board (DSB) last year. The DSB compared typical DoD development programs with successful programs from private industry. It used as case studies the development of the IBM 360 computer, the Boeing 767 transport, the AT&T telephone switch, and the Hughes communication satellite. Each of these programs compares in complexity and size to a major weapon system development, yet each took only about half as long to develop and cost concomitantly less. These commercial programs clearly represent the models of excellence we are seeking, but it is not obvious that DoD, or any large bureaucratic organization, can follow successfully the management procedures used in private industry.

To address that question, the Acquisition Task Force examined several DoD programs that were developed under special streamlined procedures—the Polaris missile, the Minuteman missile, the air-launched cruise missile (ALCM), and several highly classified projects. We found that, in these programs, DoD achieved the accelerated schedules of the successful commercial programs.

It is clear that major savings are possible in the development of weapon systems if DoD broadly emulates the acquisition procedures used in outstanding commercial programs. In a few programs, DoD has demonstrated that this can be done. The challenge is to extend the correct management techniques to all major defense acquisitions, and more widely realize the attendant benefits in schedule and costs.

To this end, we analyzed a number of successful programs to identify management features that they had in common, and that could be incorporated in the defense acquisition system. We identified six underlying features that typified the most successful commercial programs:

1. ***Clear command channels.*** A commercial program manager has clear responsibility for his program, and a short, unambiguous chain of command to his chief executive officer (CEO), group general manager, or some comparable decision-maker. Corporate interest groups, wishing to influence program actions, must persuade the responsible program manager, who may accept or reject their proposals. Major unresolved issues are referred to the CEO, who has the clear authority to resolve any conflicts.

2. ***Stability.*** At the outset of a commercial program, a program manager enters into a fundamental agreement or "contract" with his CEO on specifics of performance, schedule, and cost. So long as a program manager lives by this contract, his CEO provides strong management support throughout the life of the program. This gives a program manager maximum incentive to make realistic estimates, and maximum support in achieving them. In turn, a CEO does not authorize full-scale development for a program until his board of directors is solidly behind it, prepared to fund the program fully and let the CEO run it within the agreed-to funding.

3. ***Limited reporting requirements.*** A commercial program manager reports only to his CEO. Typically, he does so on a "management-by-exception" basis, focusing on deviations from plan.

4. ***Small, high-quality staffs.*** Generally, commercial program management staffs are much smaller than in typical defense programs, but personnel are hand-selected by the program manager and are of very high quality. Program staff spend their time managing the program, not selling it or defending it.

5. ***Communications with users.*** A commercial program manager establishes a dialogue with the customer, or user, at the conception of the program when the initial trade-offs are made, and maintains that communication throughout the program. Generally, when developmental problems arise, performance trade-offs are made—with the user's concurrence—in order to protect cost and schedule. As a result, a program manager is motivated to seek out and address problems, rather than hide them.

6. ***Prototyping and testing.*** In commercial programs, a system (or critical subsystem) involving unproven technology is realized in prototype hardware and tested under simulated operational conditions before final design approval or authorization for production. In many cases, a program manager establishes a "red team," or devil's advocate, within the program office to seek out pitfalls—particularly those that might arise from operational problems, or from an unexpected response by a competitor. Prototyping, early operational testing, and red teaming are used in concert for the timely identification and correction of problems unforeseen at a program's start.

It is clear from our earlier description that defense acquisition typically differs from this commercial model in almost every respect. Yet a number of successful DoD programs have incorporated some or all of these management features to a greater or lesser degree. We therefore concentrated our efforts on deriving a formula for action—steps by which defense acquisition can come to emulate this model to the maximum extent practical.

V. A Formula for Action

While we would model defense acquisition after the practices of the best industrial companies, we recognize the unique problems DoD faces. Management of the acquisition of military equipment requires a unique blend of flexibility and judgment. The contributions of innovative scientists and engineers, necessary for equipment to achieve maximum performance, must be matched by those of military personnel who will use and maintain the equipment. Overlaying these complexities is the need for an informed trade-off between quantity and quality. At some point, more weapons of lower performance can overcome fewer weapons of higher performance. Hence it is necessary to achieve a critical balance between high military capability and low life cycle cost. In these and other respects, defense acquisition is one of the most difficult management jobs.

Despite the difficulties, we believe it is possible to make major improvements in defense acquisition by emulating the model of the most successful industrial companies. Surely this will not be easy, because present procedures are deeply entrenched. Acquisition problems have been with us for several decades, and are becoming more intractable with the growing adversarial relationship between government and the defense industry, and the increasing tendency of Congress to legislate management solutions. In frustration, many have come to accept the ten-to-fifteen-year acquisition cycle as normal, or even inevitable.

We believe that it is possible to cut this cycle in half. This will require radical reform of acquisition organization and procedures. It will require concerted action by the Executive Branch and Congress, and the full support of defense industry. Specifically, we recommend that the Administration and Congress join forces to implement the following changes in the defense acquisition system.

A. Streamline Acquisition Organization and Procedures

As we noted in our Interim Report, federal law governing acquisition has become steadily more complex, the acquisition system more bureaucratic, and

acquisition management more encumbered and unproductive. In the absence of a single, senior DoD official working full time to supervise the overall acquisition system, policy responsibility has become fragmented. As a result, the Services have tended to assume policy responsibilities and to exercise them at times without necessary coordination or uniformity. Worse still, authority for executing acquisition programs—and accountability for their results—has become vastly diluted.

For these reasons, it is fundamental that we establish unambiguous authority for overall acquisition policy, clear accountability for acquisition execution, and plain lines of command for those with program management responsibilities. It is also imperative that we streamline acquisition procedures. This can be facilitated by five related actions:

1. **We strongly recommend creation by statute of the new position of Under Secretary of Defense (Acquisition) and authorization of an additional Level II appointment in the Office of the Secretary of Defense (OSD).**

This new Under Secretary should have full-time responsibility for managing the defense acquisition system. He should be a Level II Presidential appointee and should have a solid industrial background in the management of complex technical programs. The new Under Secretary should be the Defense Acquisition Executive. As such, he should supervise the performance of the entire acquisition system and set overall policy for R&D, procurement, logistics, and testing. He should have the responsibility to determine that new programs are thoroughly researched, that military requirements are verified, and that realistic cost estimates are made before the start of full-scale development. (In general, we believe, cost estimates should include the cost of operating and maintaining a system through its life.) He should assure that an appropriate type of procurement is employed, and that adequate operational testing is done before the start of high-rate production. He also should be responsible for determining the continuing adequacy of the defense industrial base.

Appendix B sets outs an illustrative reorganization of acquisition responsibilities within OSD. Reporting to the new Under Secretary should be a Director of Research and Engineering*; an Assistant Secretary of Defense for Production and Logistics*; the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence; the Director of Operational Test and Evaluation; and such other offices and agencies as the Secretary of Defense may designate. The Under Secretary should be responsible to the

*We use these new titles to represent a reorganization of acquisition responsibilities for officials reporting to the new Under Secretary.

Secretary of Defense for balancing the sometimes conflicting views and interests of these various offices. He should establish overall acquisition policy, as well as contract audit policy; should promulgate and issue appropriate directives and regulations; and, except for criminal investigations, should supervise oversight of defense contractors. Finally, he should prepare annual and other reports to Congress on major issues of acquisition policy and on acquisition programs.

2. **The Army, Navy, and Air Force should each establish a comparable senior position filled by a top-level civilian Presidential appointee.**

The Commission considered recommendations to consolidate all defense acquisition activities under the Defense Acquisition Executive, but concluded that such centralization would not serve the cause of reducing the bureaucracy, because it would tend to separate further the acquisition staff from the military user. We believe that it is important to maintain the Services' traditional role in managing new weapon programs.

Accordingly, we recommend that each of the Military Departments establish a Service Acquisition Executive selected by the Service Secretary in consultation with the Defense Acquisition Executive. The Service Acquisition Executive should be a top-level civilian Presidential appointee, of rank equivalent to a Service Under Secretary. He should be responsible for administering Service acquisition programs under policy guidance from the Defense Acquisition Executive; accordingly, he should have substantial experience in acquisition and should devote full time to his acquisition responsibilities. For major programs, the Defense Acquisition Executive and his Service counterpart should function respectively like chief executive officers of a corporation and a principal corporate subsidiary. They should resolve major issues and conflicts as they arise, and represent programs before most senior decision-makers (here, the Secretary of Defense, the President, and Congress, rather than a board of directors).

3. **Each Service Acquisition Executive should appoint a number of Program Executive Officers.**

Each Service Acquisition Executive should appoint a number of Program Executive Officers (PEO) who, like group general managers in industry, should be responsible for a reasonable and defined number of acquisition programs. Program managers for these programs should be responsible directly to their respective PEO and, on program matters, report *only* to him. The Defense Acquisition Executive should insure that no additional layers are inserted into this program chain of command.

4. **By this means, DoD should substantially reduce the number of acquisition personnel.**

Establishing these short, unambiguous lines of authority will streamline the

acquisition process and cut through bureaucratic red tape. This should allow for a substantial reduction in the total number of personnel in the defense acquisition system, to levels that more nearly compare with commercial acquisition counterparts.

5. **Federal laws governing procurement should be recodified into a single, greatly simplified statute applicable government-wide.**

A streamlined organization for defense acquisition is not enough. It must be matched by streamlined procedures. Over the years, Congress and DoD have tried to dictate management improvements in the form of ever more detailed and extensive laws or regulations. As a result, the legal regime for defense acquisition is today impossibly cumbersome. For example, we have identified 394 different regulatory requirements in the Federal Acquisition Regulation (FAR) and the DoD FAR Supplement that are pegged to some 62 different dollar thresholds, ranging from as little as $15 to as much as $100 million or more. In our judgment, there can be far fewer of these requirements, and those that are retained can apply at far fewer dollar thresholds.

The sheer weight of such requirements often makes well-conceived reform efforts unavailing. At operating levels within DoD, it is now virtually impossible to assimilate new legislative or regulatory refinements promptly or effectively. For these reasons, we recommend that Congress work with the Administration to recodify federal laws governing procurement in a single, consistent, and greatly simplified procurement statute.

B. Use Technology to Reduce Cost

We recommend a high priority on building and testing prototype systems to demonstrate that new technology can substantially improve military capability, and to provide a basis for realistic cost estimates prior to a full-scale development decision. Operational testing should begin early in advanced development, using prototype hardware. The early phase of R&D should employ extensive informal competition and use streamlined procurement processes. To promote innovation, the Defense Advanced Research Projects Agency should engage in prototyping and other advanced development work on joint programs and in areas not adequately emphasized by the Services.

Fully exploiting our technological leadership is critical to the national security. The Soviet Union has twice as many personnel in its armed forces, and produces military equipment in far greater quantities than the United

States. We depend on our technological advantage to offset this quantitative disadvantage. But our technology can be exploited in two quite different ways: to reduce cost (so that we can better compete in quantity), or to increase performance (so that we can compensate for our smaller quantity).

We believe that DoD should place a much greater emphasis on using technology to reduce cost—both directly by reducing unit acquisition cost and indirectly by improving the reliability, operability, and maintainability of military equipment. Cost reduction has been a primary motivation in the introduction of new technology to commercial products. This emphasis has led to a tenfold reduction in the cost of computer products during the past decade. DoD should give a similar high priority to cost reductions by exerting greater discipline in the setting of performance requirements for new platforms, and by increasing the use of technology to extend the life of existing platforms. We could, for example, extend the effective life of most of our existing aircraft ten to twenty years by replacing their electromechanical subsystems with modern microelectronics. This would reduce the cost of operating and maintaining our aircraft, and at the same time improve their performance.

In some of our new weapon systems—fighter aircraft, for example—the need for maximum performance will be sufficiently compelling to justify the introduction of state-of-the-art technology. But this is not the case for all new systems. A weapon system should be predicated on state-of-the-art technology only when the benefits of the new technology offset the concomitant risks. This principle, easy to state, is hard to apply because of the difficulty in getting reliable information with which to make the trade-off of risks and benefits.

The only consistently reliable means of getting such information is by building prototypes that embody the new technology. Accordingly, we recommend that such prototyping, either at the system or critical subsystem level, be done as a matter of course for all major weapon systems. Operational tests should be combined with developmental tests of the prototype to uncover operational as well as technical deficiencies before a decision is made to proceed with full-scale development.

The early phase of R&D should follow procedures quite different from those of approved production programs, in order to complete the entire prototyping cycle in two or three years. Contracting should be streamlined to speed up the process of evaluating diverse new ideas. In the advanced technology phase of a program, competition should play a critical role, but the emphasis should be on an informal competition of ideas and technologies, rather than a formal competition of cost. At this stage, a formal competition based on detailed specifications not only is ineffective, but also introduces substantial delay. In fact, recent emphasis on cost competition has stretched out the time required to let some R&D contracts from a few months to as much as a year.

In general, prototyping and testing in the early stage of R&D should be done by the Service that would be the primary user of the resulting system. In order to promote the use of prototyping, however, we recommend expanding the role of the Defense Advanced Research Projects Agency (DARPA).

At present, DARPA conducts research and exploratory development in high-risk, high-payoff technologies. DARPA should have the additional mission of stimulating a greater emphasis on prototyping in defense systems. It should do this by actually conducting prototype projects that embody technology that might be incorporated in joint programs, or in selected Service programs. On request, it also should assist the Services in their own prototyping programs. The common objective of all of these prototyping programs should be to determine to what extent a given new technology can improve military capability, and to provide a basis for making realistic cost estimates prior to a decision on full-scale development. In short, the prototype program should allow us to fly—and know how much it will cost—before we buy.

C. Balance Cost and Performance

A restructured Joint Requirements and Management Board (JRMB), cochaired by the Under Secretary of Defense (Acquisition) and the Vice Chairman of the Joint Chiefs of Staff, should play an active and important role in all joint programs and in all major Service programs. The JRMB should define weapon requirements for development, and provide thereby an early trade-off between cost and performance.

Full-scale development of a new weapon system is the single most critical step in the acquisition process. At this point, a number of fundamental decisions must be made—whether to undertake a new development or adapt an existing system, how far to push the new technology being incorporated in the system, what cost and schedule to authorize, and what the management structure will be. Misjudgment about any of these items can start a program off on a course that dooms it to failure. Currently, this critical decision is made by the Secretary of Defense, acting on advice from the Defense Systems Acquisition Review Council (DSARC), after the DSARC has made a detailed review of whether the proposed system will meet the stated user requirements and whether the cost and schedule estimates are credible. The recommended new emphasis on prototyping will contribute materially to improving the judgments about cost and schedule estimates. But the DSARC process, while adequate to determine whether the proposed specifications will meet the stated

user requirements, lacks a viable mechanism for *challenging* those requirements.

Fundamental to the ultimate success of a new program is an informed trade-off between user requirements, on the one hand, and schedule and cost, on the other. A delicate balance is required in formulating system specifications that allow for a real advance in military capability but avoid goldplating. Generally, users do not have sufficient technical knowledge and program experience, and acquisition teams do not have sufficient experience with or insight into operational problems, to strike this critical balance. It requires a blend of diverse backgrounds and perspectives that, because the pressures for goldplating can be so great, must be achieved at a very high level in DoD.

The DSARC is not the proper forum for effecting this balance. It has had very little success, for example, in stimulating the use of nondevelopmental items as an alternative to developing unique military products. Any time the military needs new trucks, tractors, radios, computers, and transport aircraft, for example, it should be the rule rather than the exception that DoD adapts products already developed by industry or by the armed forces of an allied nation. Much greater reliance on such items could realize major savings of money and time, but experience indicates that a decision to use non-developmental items must come from a high level in DoD, and must reflect operational judgment as well as technical sophistication.

We recommend, therefore, that the JRMB be restructured to make such trade-offs and then to decide whether to initiate full-scale development. The JRMB should have this authority for all joint programs and appropriate Service programs. It should evaluate major trade-offs proposed as a program progresses. Its determination, in effect, should substitute for the decision now made by the DSARC at what is called Milestone II. The JRMB should be cochaired by the Under Secretary of Defense (Acquisition) and the Vice Chairman of the Joint Chiefs of Staff.

Thus, the JRMB should be responsible for two decisions commonly made in industry, but not now an explicit part of DoD's decision-making process. One of these is the "affordability" decision, and the other is the "make-or-buy" decision.

The affordability decision requires that a subjective judgment be made on how much a new military capability is worth. If a new weapon system can be developed and produced at that target cost, it may be authorized for development; otherwise, ways should be found to extend the life of the existing system. Determining a target cost is difficult, to be sure, but CEOs in industry must make comparably difficult decisions on which their companies' survival depends.

The make-or-buy decision requires that the JRMB assess the need for a

unique development program, and determine if it is possible instead to buy or adapt an existing commercial or military system. At present, DoD passes up many valid opportunities for adapting existing systems, opportunities that could improve military capability more quickly and at reduced cost.

D. Stabilize Programs

Program stability must be enhanced in two fundamental ways. First, DoD should fully institutionalize "baselining" for major weapon systems at the initiation of full-scale engineering development. Second, DoD and Congress should expand the use of multi-year procurement for high-priority systems.

In connection with the decision to begin full-scale development of a major new program, the program manager should prepare a brief baseline agreement describing functional specifications, cost, schedule, and other factors critical to the program's success. This baseline agreement should be submitted, through the responsible Program Executive Officer and the Service Acquisition Executive, for approval by the Defense Acquisition Executive.

Within the terms of this agreement, the program manager should have full authority to execute the program. He should be fully committed to abide by the program's specified baseline and, so long as he does so, the Defense and Service Acquisition Executives should support his program and permit him to manage it. This arrangement would provide much-needed program stability, which could be enhanced significantly if the program were approved for multi-year funding. We recommend that Congress approve multi-year funding for the development and low-rate production of all major programs approved for full-scale development by the JRMB. In this way, Congress could join in the baseline agreement with the program manager, enhance program stability, and promote lower unit prices.

A program manager should agree to a baseline for all phases of his program. For the Acquisition Executives, however, the agreement should extend only to the first two phases of a program, full-scale development and low-rate production. Before a program could enter its third phase, high-rate production, it must be subjected to developmental and operational testing. Operational tests are particularly critical, and should continue through full-scale development. The first units that come off a low-rate production line should be subjected to intensive operational testing. Low-rate production should continue during testing, but a program should not be approved for high-rate production until the results of these tests are evaluated.

The JRMB should then reconsider the program at its second major milestone—whether to authorize high-rate production, at what level of

funding, and on what schedule. At this stage, available test results should provide a realistic portrait of the weapon's probable performance under operational conditions, current intelligence data should yield a realistic threat estimate, and low-rate production experience should provide a realistic estimate of production costs. Thus, the JRMB would possess the necessary data to make an informed judgment on high-rate production.

If the JRMB so determines, a program manager could proceed in accordance with the balance of his baseline agreement. Congress would be asked to authorize multi-year funding for the production phase of the program.

E. Expand the Use of Commercial Products

Rather than relying on excessively rigid military specifications, DoD should make greater use of components, systems, and services available "off-the-shelf." It should develop new or custom-made items only when it has been established that those readily available are clearly inadequate to meet military requirements.

No matter how DoD improves its organization or procedures, the defense acquisition system is unlikely to manufacture products as cheaply as the commercial marketplace. DoD cannot duplicate the economies of scale possible in products serving a mass market, nor the power of the free market system to select and perpetuate the most innovative and efficient producers. Products developed uniquely for military use and to military specifications generally cost substantially more than their commercial counterparts. DoD program managers accordingly should make maximum use of commercial products and devices in their programs.

A case in point is the integrated circuit or microchip—an electronic device used pervasively in military equipment today. This year DoD will buy almost $2 billion worth of microchips, most of them manufactured to military specifications. The unit cost of a military microchip typically is three to ten times that of its commercial counterpart. This is a result of the extensive testing and documentation DoD requires and of smaller production runs. (DoD buys less than ten percent of the microchips made in the U.S.) Moreover, the process of procuring microchips made to military specifications involves substantial delay. As a consequence, military microchips typically lag a generation (three to five years) behind commercial microchips.

When military specifications for microchips were first established, they assured a high standard of quality and reliability that was worth a premium

price. The need for quality and reliability in military equipment is as great as ever. In the last few years, however, industrial consumers of microchips have come to demand equivalent standards, and manufacturing processes and statistical methods of quality control have been greatly improved. It is now possible for DoD program managers to buy the bulk of their microchips from commercial lines with adequate quality and reliability, and thus to get the latest technology at a substantially lower cost. The Electronic Systems Division, responsible in the Air Force for the quality of electronic devices, recently began revising its procedures to achieve these objectives. We recommend that the Air Force accelerate its efforts and that the other Services follow its lead.

This same principle—the expanded use of commercial items—can apply to a great variety of products and services bought by DoD. These range from personal computers, computer software, and professional services, to a host of non-technical products such as bath towels and steak sauce.

We recommend that the Defense Acquisition Executive take steps to assure a major increase in the use of commercial products, as opposed to those made to military specifications. He should direct that program managers get a waiver before using a product made to military specifications, if there is an available commercial counterpart. When a "make-or-buy" decision must be made, the presumption should be to buy. This would invert present procedures, biasing the system in favor of commercial products and services, but permitting the use of items made to military specifications whenever a program manager believes it necessary to do so.

In addition, we recommend that the DoD Supplement to the Federal Acquisition Regulation be changed to encourage streamlining military specifications themselves. Applying full military specifications, far from being ideal, can be wasteful. A program manager should strive to invoke neither minimum nor maximum, but only relevant, requirements; and he should think in terms of optimization rather than deviations and waivers.

Thus, DoD should reduce its use of military specifications when they are not needed, and should take steps to improve the utility of military specifications when they are needed. This will require a serious effort to harmonize military specifications with the various commercially used specifications. For example, required military drawings for integrated circuits could incorporate a manufacturer's standard design specifications, test methods, and test programs. More generally, military specifications could be based on industry standards, such as those promulgated by the American National Standards Institute and the American Society for Testing and Materials. This would provide the technical underpinning for DoD to make substantially greater use of commercial devices and products, and thereby take advantage of the much lower costs that result from larger production runs.

One indirect benefit of buying commercial products is that the price is determined by market forces. This should relieve DoD of the administrative burden and cost of verifying a producer's overhead costs. For DoD to realize the full benefit of commercial buying, it should let competitive market forces provide a check on price and direct its own attention to validating quality.

F. Increase the Use of Competition

Federal law and DoD regulations should provide for substantially increased use of commercial-style competition, emphasizing quality and established performance as well as price.

Even when commercial products are not suitable for DoD's purposes, it can still use commercial buying practices to real advantage. Foremost among these practices is competition, which should be used aggressively in the buying of systems, products, and professional services. DoD clearly understands the need for such competition, which was articulated in the 1981 Carlucci Initiatives. Although DoD has made major efforts in this direction, much more can be done. It is particularly important to focus on achieving more effective competition, modeled after the competitive procurement techniques used in industry.

Commercial procurement competition simultaneously pursues several related objectives: attracting the best qualified suppliers, validating product performance and quality, and securing the best price. Price is, of course, as important a factor in commercial procurement as it is in DoD procurement. But it is only one of several equally important factors. Price should not be the sole determinant, especially for procurement of complex systems and services. Defense procurement tends to concentrate heavily on selecting the lowest price offeror, but all too often poorly serves or even ignores other important objectives.

In validating product quality, for example, DoD places too much emphasis on specific details of how the manufacturing process is to be done and too little on modern techniques of quality control. Industry makes extensive use of statistical sampling, and will accept or reject an order on that basis. Typically, an industrial company will keep lists of qualified suppliers that have maintained historically high standards of product quality and reliability. As long as these standards are maintained, industrial buyers do not require exhaustive inspection, and thereby save expense on both sides. Suppliers are highly motivated to get—and stay—on lists of qualified suppliers by consistently exceeding quality control standards.

Moreover, because competition is not a one-way street for the buyer, defense procurement practices must be less cumbersome if DoD is to attract the best suppliers. Procurement officers must be allowed and encouraged to solicit bids through purchase descriptions that are stated as functional performance characteristics rather than through detailed design and "how-to" specifications; to limit bids to qualified suppliers; to give preference to suppliers that have demonstrated the quality and reliability of their products; and to recognize value (quality and price) based on products' commercial acceptance in the marketplace. These practices have been found to yield effective competition in the commercial field, and their use in defense acquisition could provide better military equipment at no increase in cost.

Although Congress has ardently advocated increasing competition, some provisions of recent legislation in fact work at cross purpose to that objective. For example, burdening suppliers of off-the-shelf catalog items to identify all component parts and their producers, or to submit detailed pricing certifications, inhibits qualified companies from competing for government contracts. Regulatory implementation—for example, DoD's efforts to require contractors to release rights in technical data on their products—has a similar effect.

A further problem stems from confusion regarding the intent of recent legislation—notably the Competition in Contracting Act's (CICA) requirement of "full and open competition," which some have interpreted to mean that the government *must* buy from the lowest offeror. CICA sought to make it clear that the award of a contract through competitive negotiation is a method of procurement no less acceptable than an award using formal advertising or sealed bids, and thus to recognize that competition entails more than just an assessment of lowest price. This goal has been obscured by the notion that full and open competition precludes the government from establishing qualification criteria, and forces the award of a contract based on price without regard, for example, to technical expertise or life cycle costs. This reinforces DoD's proclivity for writing detailed military specifications rather than functional product descriptions—in this context, in order to insure that all bidders offer identical items. At the same time, however, these narrow product specifications preclude the acquisition of most commercial products and, in effect, DoD's doing business with many qualified suppliers. Thus, the full potential of CICA is not being realized because of a focus on the quantity rather than the quality of competition.

In sum, we believe that DoD should greatly increase its use of truly effective competition, using as a model the competitive buying practices of major corporations and their suppliers. We recommend the elimination of

those legal and regulatory provisions that are at variance with full establishment of commercial competitive practices.

G. Enhance the Quality of Acquisition Personnel

DoD must be able to attract and retain the caliber of people necessary for a quality acquisition program. Significant improvements should be made in the senior-level appointment system. The Secretary of Defense should have increased authority to establish flexible personnel management policies necessary to improve defense acquisition. An alternate personnel management system should be established to include senior acquisition personnel and contracting officers as well as scientists and engineers. Federal regulations should establish business-related education and experience criteria for civilian contracting personnel, which will provide a basis for the professionalization of their career paths. Federal law should permit expanded opportunities for the education and training of all civilian acquisition personnel.

Our study convinces us that lasting progress in the performance of the acquisition system demands dramatic improvements in our management of acquisition personnel at all levels within DoD.

A pivotal recommendation of the Commission is the establishment of the position of Under Secretary of Defense (Acquisition) and comparable Service positions, all to be filled by leaders with outstanding business management credentials. Recruiting the most capable executives for jobs of such importance to the nation is extremely difficult, however, in the face of current disincentives to entering public service. A recent report of the Presidential Appointee Project of the National Academy of Public Administration* analyzes this problem and details twenty-three separate recommendations for improving the recruitment of senior-level Executive Branch personnel. These include, for example, specific suggestions for simplifying financial disclosure reports and for allowing Presidential appointees to defer capital gains taxes incurred by divesting assets to comply with conflict-of-interest provisions. Such steps would improve the government's ability to attract and retain the highly qualified people needed for effective senior management of defense acquisition. We strongly support these proposals.

**Leadership In Jeopardy: The Fraying of the Presidential Appointments System* (Final Report of the Presidential Appointee Project), November 1985.

Comparable improvements also are required for effective middle management and better line personnel. The defense acquisition work force mingles civilian and military expertise in numerous disciplines for management and staffing of the world's largest procurement organization. Each year billions of dollars are spent more or less efficiently, based on the competence and experience of these personnel. Yet, compared to its industry counterparts, this work force is undertrained, underpaid, and inexperienced. Whatever other changes may be made, it is vitally important to enhance the quality of the defense acquisition work force—both by attracting qualified new personnel and by improving the training and motivation of current personnel.*

The General Accounting Office (GAO) has been engaged in an important study to evaluate the capabilities of DoD program managers and contracting officers. The results of GAO's study† confirm the central importance of improving the quality of training for these two critical acquisition specialties.

The caliber of uniformed military personnel engaged in program management has improved significantly of late. Military officers manage over 90 percent of DoD's roughly 240 program offices. Their ranks range from 0–5 (lieutenant colonel/commander) to 0–8 (major general/rear admiral). Each of the Services has established a well-defined acquisition career program for its officers. These include the Army's Materiel Acquisition Management (MAM) program, the Navy's Materiel Professional (MP) programs, and detailed career planning regulations for Air Force technical personnel and program managers. We strongly support these measures. We also support recent legislation that has further defined career paths for all program managers. In 1984, Congress established a minimum four-year tenure for program management assignments. The 1986 Authorization Act prescribed requisite qualifications and training, including at least eight years of acquisition-related experience and appropriate instruction at the Defense Systems Management College (or equivalent training).

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*To this end, the Assistant Secretary of Defense for Acquisition and Logistics recently proposed creating a single Defense Acquisition Corps, modeled after the State Department's Foreign Service. See *DoD Acquisition Improvement—The Challenges Ahead*, Perspectives of the Assistant Secretary of Defense for Acquisition and Logistics: White Paper No. 2—Revitalization of the DoD Acquisition and Logistics Workforce (Nov. 5, 1985). We studied this proposal carefully, and support many of its specific features. Because it would have the undersirable result of putting too much distance between acquisition programs and users, however, we do not support the proposal in its full form.

†See U.S. General Accounting Office, *DoD Acquisition: Capabilities of Key DoD Personnel in System Acquisition* (GAO/NSIAD–86–45).

By contrast, much more remains to be done concerning civilian acquisition personnel generally. Civilians frequently cite the rigid pay grades and seniority-based promotion standards of the federal civil service as disincentives to continued employment. Higher pay and better opportunities in private industry lure the best college graduates and the brightest trainees away from government, particularly in such highly competitive fields as science, engineering, and contracting. One extremely important means to improve the acquisition work force is to establish an alternative personnel management system permitting greater flexibility with respect to the status, pay, and qualifications of civilian employees.

We reviewed the results of the Navy's so-called China Lake personnel project, in which recruitment and retention of key civilians were correlated with pay, incentives, and advancement based on performance. The China Lake experiment, which is outlined briefly in Appendix C, served to increase the retention of engineers and scientists, improve supervisor-employee relationships, and dramatically reduce management paperwork. Legislation is now pending to implement such a system for all federal scientists and engineers. The China Lake personnel system has produced significant benefits. It merits expansion. We therefore recommend that federal law permit the Secretary of Defense to include other critical acquisition personnel in such a system, and facilitate greater professionalism among civilian acquisition employees through government sponsorship of graduate instruction in acquisition management.

Among acquisition personnel, contract specialists have an especially critical role. More than 24,000 members of DoD's acquisition work force specialize in the award and administration of contracts. Eighty-five percent of these contract specialists are civilians. Contract specialists must master the extensive, complex body of knowledge encompassing materials and operations management, contract law, cost analysis, negotiation techniques, and industrial marketing. Yet, the Office of Personnel Management designates the Contract Specialist personnel series (GS 1102) as an administrative and not a professional series under Civil Service Title VIII. This administrative designation prohibits the establishment of *any* business education requirement for contract specialists. As a result, only half of DoD's contract specialists have college degrees, which may or may not be business-related. We recommend establishing a minimum education and/or experience requirement for the Contract Specialist series. Such a requirement, similar to that now established for the Accounting personnel series, would mandate an entry-level criterion of twenty-four semester hours in business-related courses or equivalent experience.

Independently, DoD should enhance the professional status of contract specialists by increasing the number of outside hires, conducting on-campus

recruitment, mandating the use of written tests for in-service placement and promotion, and establishing upward mobility programs for purchasing agents (GS 1105) and procurement clerks (GS 1106). DoD already has established acquisition training programs at five major facilities, and requires that all civilian contract specialists complete an average of six-hundred hours of mandatory training. According to a 1984 report of the DoD Inspector General,* however, approximately two-thirds of all DoD contract specialists had not completed this training. In a recent report, the Executive Committee on Federal Procurement Reform† also recognized the inadequate training given contract specialists.

Insufficient management attention and financial resources are serious impediments to adequate training of contract specialists and, for that matter, all acquisition personnel. Such training—like that provided generally in DoD intern programs—should be centrally managed and funded. This is necessary to improve the utilization of teaching faculty, to enforce compliance with mandatory training requirements, and to coordinate overall acquisition training policies.

*Office of the Inspector General, DoD, *Report on the Audit of Department of Defense Procurement Training*, No. 84-047 (Feb. 14, 1984).

†Executive Committee on Federal Procurement Reform Task Group No. 6, *Guidance on Establishing Procurement Career Management Programs*, Vol. I (May 1985).

VI. Recommended Executive and Legislative Changes

We have described a series of major reforms that, taken in aggregate, can make the defense acquisition system substantially more efficient. These reforms not only will save money but also will improve military capability by reducing the time it takes to field new weapon systems. Most of these reforms can be implemented by the President and Secretary of Defense. Some will require legislation.

We urge that Congress take the following steps:

- Create by statute the new position of Under Secretary of Defense (Acquisition); authorize an additional Level II appointment in the Office of the Secretary of Defense; and make necessary conforming changes to the current statutory organization of acquisition responsibilities within that Office.

- Recodify federal laws governing acquisition in a single, consistent, and greatly simplified procurement statute; and remove those features of current law and regulation that are at variance with the expanded acquisition of commercial products and the establishment of effective commercial-style procurement competition.

- Simplify and clarify financial disclosure reporting forms; amend tax laws to permit Presidential appointees to delay the impact of capital gains taxes they incur in divesting assets to comply with conflict of interest laws; and take other legislative actions necessary to implement fully the recommendations of the National Academy of Public Administration's Presidential Appointee Project.

- Amend civil service laws to permit flexible personnel management policies for acquisition professionals, and to expand opportunities for the education and training of all acquisition personnel.

- Authorize and appropriate multi-year funding of those programs for which the Joint Requirements and Management Board (as restructured by the Secretary of Defense) has authorized full-scale development or high-rate production.

We urge that the Secretary of Defense change current DoD acquisition organization and procedures as follows:

- Request that Congress create the new position of Under Secretary of Defense (Acquisition); designate this Under Secretary as the Defense Acquisition Executive; and invest him with full authority to supervise the defense acquisition system, including authority over all offices and agencies within the Office of the Secretary of Defense necessary for that purpose.

- Designate Service Acquisition Executives within each Military Department; and retain within the Services the traditional responsibility for managing acquisition programs.

- Assign to the Defense Advanced Research Projects Agency a specific mission in the conduct of prototype programs; and direct the Services to increase their emphasis on prototyping.

- Restructure the Joint Requirements and Management Board (JRMB) by directing that it be cochaired by the Under Secretary of Defense (Acquisition) and the Vice Chairman of the Joint Chiefs of Staff; delegate to this restructured JRMB the responsibility for authorizing full-scale development and high-rate production in all joint programs and in major Service programs; and direct the JRMB to:
    1. require the testing of prototype systems and subsystems before the authorization of full-scale development;
    2. require the use of baselining for all major new programs;
    3. require that operational test data be available before the authorization of high-rate production; and

4. significantly increase the use of nondevelopmental items as an alternative to new development programs.

- Instruct the Defense Acquisition Executive to take steps necessary to amend the DoD Supplement to the Federal Acquisition Regulation so as to:
  1. effect a major increase in the acquisition of available commercial components and systems by requiring program managers to obtain waivers for use of products made to military specifications when commercial alternatives are available; and
  2. establish commercial-style competitive procurement practices to the full extent permitted by law.

VII. Conclusion

At a recent meeting with the Defense Science Board, the Chairman of the Joint Chiefs of Staff stated that the most important way technology could enhance our military capability would be to cut the acquisition cycle in half. We agree that this objective is critically important, and we believe that it can be achieved. It cannot be done by technology alone, however. It requires a radical departure from our current organization and procedures. This, in turn, necessitates a new spirit and a willingness to change among acquisition professionals. It demands that government and industry repair their vital partnership. Most importantly, it presumes a special cooperation between Congress and the Executive to act for substantial improvement of the defense acquisition system.

We urge Congress and the Administration to work together to implement the Commission's formula for action to accomplish these critical reforms.

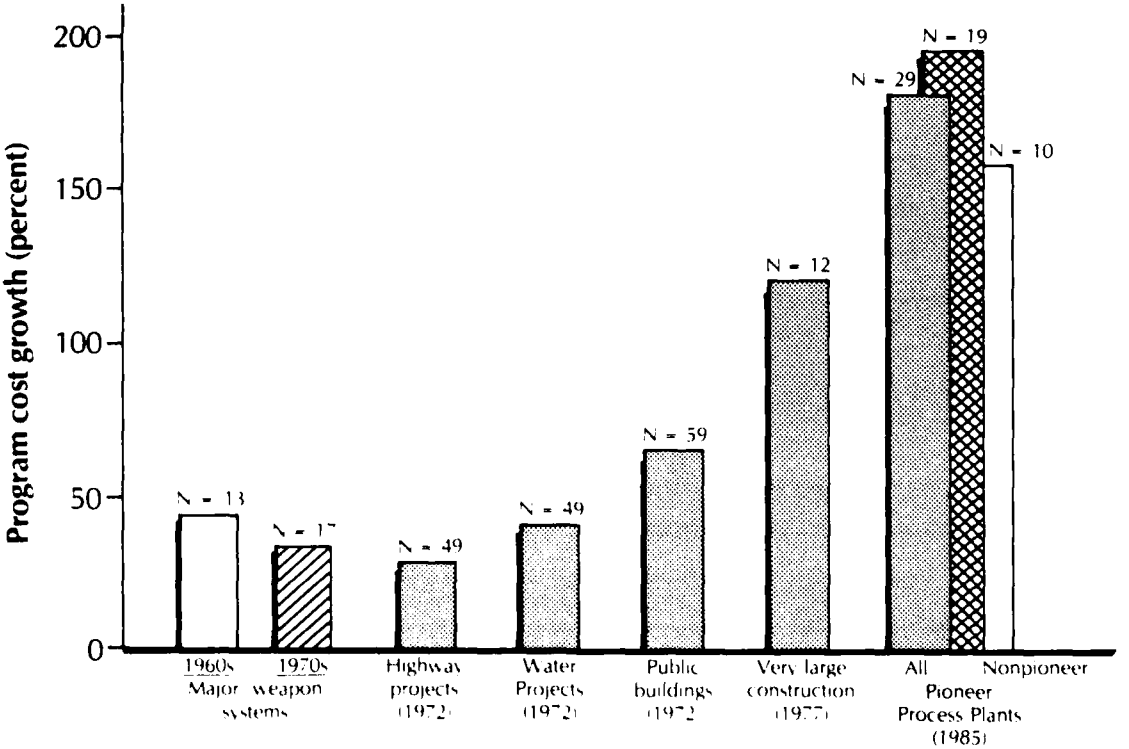
APPENDIX A

A Comparison of Cost Growth in Defense and Non-Defense Programs

Rand Corporation and The Analytic Sciences Corporation (TASC) separately analyzed the cost growth experienced by major DoD weapon system programs and comparably large, complex civil programs. The civil programs included numerous public and private sector projects that typically required many years to develop, involved substantial technical risks, and depended on the performance of many contractors. The results of these studies are outlined in Figures A-1 and A-2. Both studies lead to the conclusion that average cost growth in major DoD weapon system programs is lower than cost growth in many large scale civil programs.

Figure A-1

COST GROWTH IN MAJOR PROJECTS (RAND)



Source: Improving the Military Acquisition Process—Lessons from Rand Research (R-3373-AF/RC) The Rand Corporation, 1986

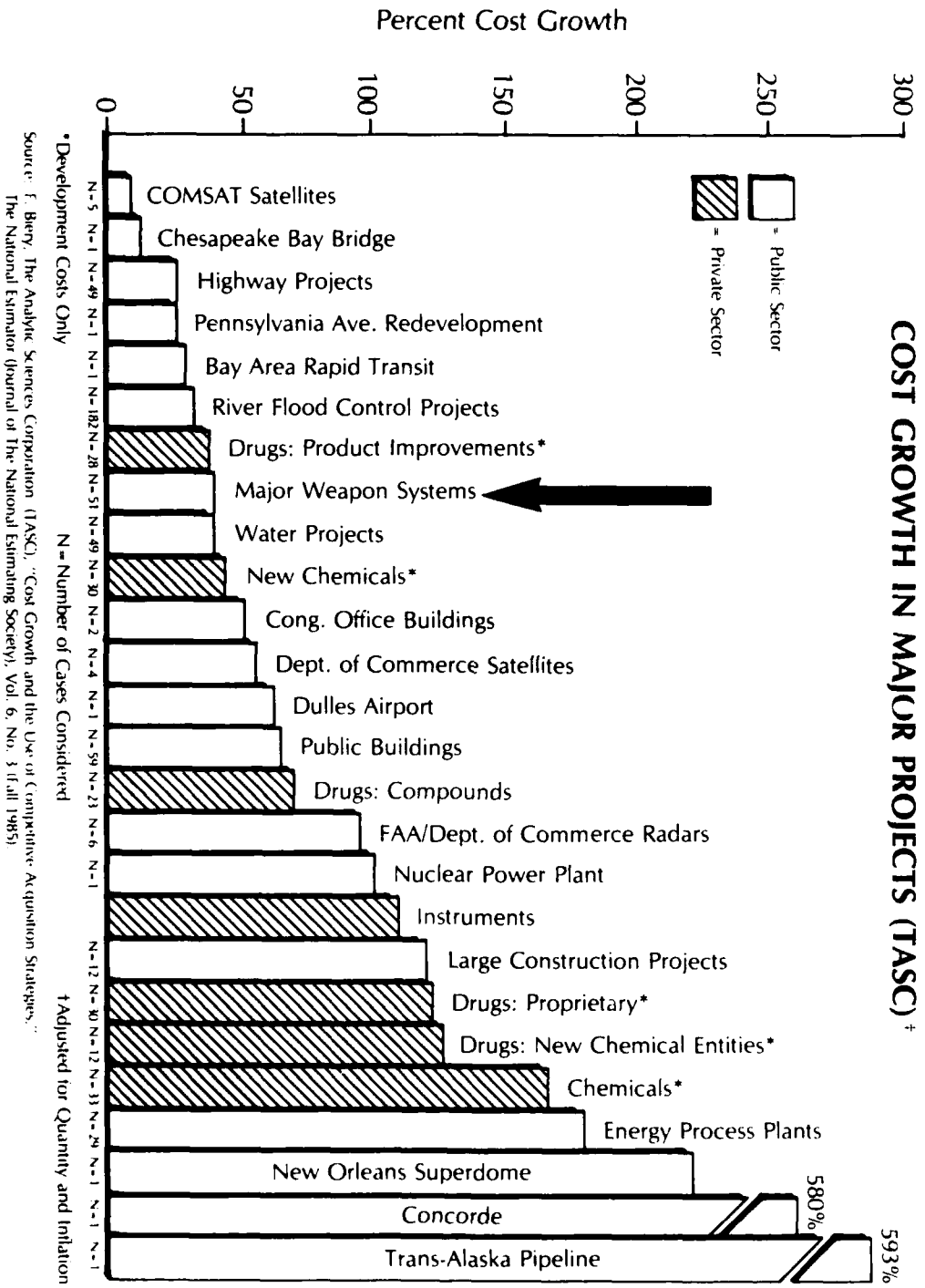


Figure A-2

COST GROWTH IN MAJOR PROJECTS (TASC) †

*Development Costs Only

N = Number of Cases Considered

†Adjusted for Quantity and Inflation

Source: F. Biery, The Analytic Sciences Corporation (TASC), "Cost Growth and the Use of Competitive Acquisition Strategies," The National Estimator (Journal of The National Estimating Society), Vol. 6, No. 3 (Fall 1985).

APPENDIX B

An Illustrative Organization of the Acquisition Staff of the Secretary of Defense

The current organization of the Office of the Secretary of Defense (OSD) allocates acquisition responsibilities generally as follows among eight senior OSD officials*:

1. The Under Secretary of Defense for Research and Engineering (USDR&E) provides policy and oversight for weapon system program development through full-scale engineering. USDR&E is responsible for managing the Defense Advanced Research Projects Agency (DARPA) and for developmental test and evaluation.

2. The Assistant Secretary of Defense (Comptroller) is responsible for all DoD financial matters and for management of the Defense Contract Audit Agency (DCAA).

3. The Assistant Secretary of Defense (Acquisition and Logistics) is responsible for policy and oversight of weapon system production, logistics, contracting policy and regulation, and management of the Defense Logistics Agency (DLA).

4. The Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) (C^3I) is responsible for C^3I systems and policy and oversight of all associated research, development, and production activities.

5. The Director of Program Analysis and Evaluation (PA&E) is responsible for providing the Secretary of Defense with an independent assessment of DoD programs, including force structure, mission areas, weapon systems, manpower, etc. The Cost Analysis Improvement Group, which provides independent cost assessment of weapon system programs, reports to the Director of PA&E.

6. The Inspector General (IG) has authority to evaluate all DoD operations and activities, to oversee all phases of the acquisition process, to establish contract audit policy, and to investigate potential criminal conduct and evidence of fraud, waste, or abuse.

7. The Director of Operational Test and Evaluation (OT&E) provides policy and oversight for operational testing and evaluation, and assesses the success of weapon system testing conducted by the Services.

8. The Director of Small and Disadvantaged Business Utilization establishes, and monitors the achievement of, policy and budget goals for utilization of small and disadvantaged businesses.

To consolidate diverse policy-making responsibilities for improved management of the overall acquisition system, the Commission has recommended establishment by law of the position of Under Secretary of Defense for Acquisition (USD(A)). In the

*Certain of these officials—notably the Comptroller, Assistant Secretary of Defense (C^3I), the Director of PA&E, and the Inspector General—have various non-acquisition responsibilities not fully described here.

Commission's view, this new Under Secretary should have extensive experience in industrial management, and should:

- Be a Level II appointee.
- Work full-time on acquisition matters.
- Cochair the restructured Joint Requirements and Management Board.
- Serve as a member of the Defense Resources Board.
- Develop and implement DoD-wide acquisition policy, including policy for research and development and operational testing, and contract audit.
- Oversee the execution of weapon system programs, so that development and production decisions are validated by program requirements, technical performance, and cost.
- Generally supervise contractor performance.

For these broad purposes, the USD(A) should have authority over all elements of the OSD necessary to place the following functions under his direct supervision:

- All acquisition policy, including contract audit policy.
- Oversight of all acquisition programs (including C^3I programs) at ail stages (including conceptualization, research, development, testing, production, and logistics).
- Oversight of advanced technology programs.
- Oversight of Test and Evaluation (T&E), including both developmental and operational T&E.
- Oversight of small and disadvantaged business utilization.
- Responsibility for independent cost assessments, including those of weapon system programs.

APPENDIX C

The Navy Demonstration Project: An Alternative Personnel Management System

Purpose

The Federal Classification and Compensation System of the Civil Service has remained largely unchanged since the passage of the Classification Act of 1923. In intervening years, the size and composition of the federal work force has changed dramatically. Today there is widespread agreement that the Civil Service system frequently inhibits effective recruitment, retention, and management of federal civilian employees. This is especially true of occupations for which there is strong private sector demand, such as scientists, computer specialists, engineers, and contract specialists.

In 1980, the Office of Personnel Management authorized the Department of the Navy to conduct a five-year demonstration of an alternative personnel system, designed to allow management to reward individual performance and compete in the labor market for high quality personnel. Under the authority of the Civil Service Reform Act of 1978, the Navy has conducted this Personnel System Demonstration project at the Naval Weapons Center at China Lake, California, and at the Naval Ocean Systems Center in San Diego. In 1984, the project was extended for a second five-year period.

Features

The project has included full-time personnel in the scientist, engineer, senior professional, administrative, and technical specialist career fields at both Naval facilities. At the San Diego facility, the project also has included clerical personnel, in order to ensure a comprehensive basis for evaluating the alternative system's performance and potential.

In the alternative system, five new general personnel classification levels have replaced the 18-grade General Schedule. The system initially has assigned each employee to a respective classification level on the basis of his attained professional expertise. Thereafter, it has ranked each employee competitively within his respective classification level on the basis of the quality of his performance. Length of service and veterans preference have been secondary considerations. The higher an employee's performance rating, the better his chance of advancement—or retention in the event of personnel cutbacks.

Each classification level is matched to a broad range of compensation. (See Figure C–1.) The broad pay ranges applicable at different levels of expertise have allowed line managers significantly more flexibility to make initial salary offers competitive with local market conditions. Compensation has been linked to performance, rather than time in grade. Thus, it has been possible to reward deserving individuals with higher pay without having to promote them to a higher classification level. Moreover, both Naval facilities have established pools for cash

awards in order to provide managers an additional means for recognizing superior performance. End-of-year performance bonuses have provided tangible incentives, and have made it possible to reward especially deserving employees without permanently increasing their pay.

Results of the First Five Years

For its initial five-year period, the demonstration project reported the following salient results:

- Improved ability to attract high quality personnel to entry-level positions.
- Dramatically reduced separation rates for scientists and engineers—from 8.1 percent in 1979 to 4.2 percent in 1983.
- Improved employee morale, through greater potential for advancement and professional growth.
- *Reduced personnel management* costs and streamlined personnel administration, including the reduction of personnel paperwork by 50 to 80 percent.

Figure C-1

CLASSIFICATION/PAY BAND EXAMPLE*

Classification Group: Scientists, Engineers and Senior Staff

Current System	Navy Personnel System Demonstration Project	Pay Range (in thousands)
GS–5 6 7 8	I Entry Level	$14.4 to 25.7
9 10 11	II Advanced Training	21.8 to 34.3
12 13	III Journeyman	31.6 to 48.9
14 15	IV Senior Specialists, Supervisors & Managers	44.4 to 67.9
16 17 18	V Professional Exceptional	61.3 to 72.3 (pay ceiling set by Congress)

*Other classification groups, such as technicians, technical specialists, administrative specialists, and clerical, have similarly designed pay bands.

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