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ACQUIRING DEFENSE SYSTEMS
A QUEST FOR THE BEST

DAVID D. ACKER

DSMC PRESS TECHNICAL REPORT, TR 1-93

ACQUIRING DEFENSE SYSTEMS
A QUEST FOR THE BEST

MY OBSERVATIONS
DURING FOUR DECADES
AS AN ENGINEER, MANAGER
AND COLLEGE PROFESSOR
IN GOVERNMENT AND INDUSTRY

DAVID D. ACKER
Professor of Management

JULY 1993
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This book is dedicated

to

my wife, Lillian, our daughters

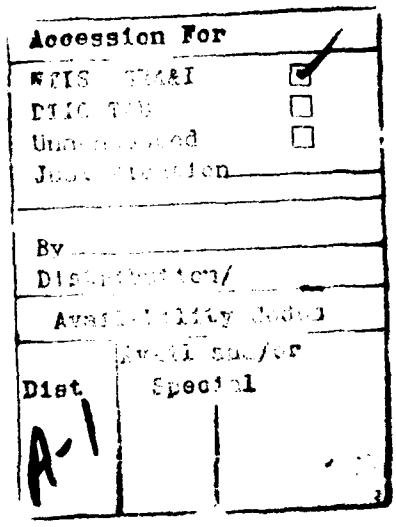
Suzanne and Maritta

and

my friends and associates in the

defense and space communities

through the years.



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PREFACE

The book may be considered as both a treatise and a reference work designed to provide the reader with as broad a view as possible of the quest for excellence in managing the acquisition of defense (and space) systems and equipment since the end of World War II. At that time, the challenge to preserve the peace became clear, as did the need to manage successfully our scientific, engineering and manufacturing endeavors, be they government or industry in nature.

Many of us now practicing management started out doing something else. Then, according to Thomas R. Horton, president of the American Management Association, the challenge of management arises and "there is need to learn a new profession. Dedicated managers take their roles seriously and commit themselves to a process of lifelong learning....The engineer who becomes a successful manager learns to take the new management calling just as seriously as he takes the profession of engineering." (This describes my experience in many respects.)

Since the 1940s, many experts have appeared along the way. An expert, as I see it, is a skillful person with much knowledge and training in a special field. Such a person becomes known as an authority to whom others defer. But, history taught us that experts have just as much trouble as others in making accurate predictions – especially (as Samuel Langhorne Clemens notes) when those predictions refer to the future.

Government and industry produce experts who can be wrong. With rapid advances in science, many experts emerge. One of the problems of becoming an expert is that others seek, even demand, predictions. But predictions can be wrong. For example, in 1895 Baron William Thomson Kelvin said: "Heavier-than-air flying machines are impossible." In the 1930s, Theodore von Karman thought that flying faster than the speed of sound was impossible because "no material could hold up as it passed through the sound barrier." Later, when von Karman was asked what he had done wrong, he replied: "My mistake was in writing my prediction down." One of the pitfalls of having to play the role of an expert is that one becomes reluctant to express one's true ignorance.

Probably the expert with the best track record for predictions was Leonardo da Vinci, who lived from 1452 to 1519. He studied anatomy, astronomy, botany, geology and fluid mechanics, and drew plans for hundreds of inventions. For example, he drew plans for a flying machine, a parachute, a movable bridge, a tank and a submarine. His success was partly due to the fact that he was an excellent observer, and he never said "never." In his predictions, he focused on what might be, rather than on what appeared to be impossible at the time. In order for us, our institutions and our society to fully embrace the future, we would do well to nourish the spirit of openness expressed by da Vinci, and I hope I have been able to do so in this book.

The book describes my experience and findings in the technological-management world. It conveys what I have observed and learned in industry, government, and academia...and sets forth my special point of view in the engineering, manufacturing, and management environments in my personal quest for excellence. There are many good approaches that can be taken in any quest. Some will be successful; others will not.

For years I have been directly involved in the acquisition of defense and space systems programs in the United States, both in industry and in government. I experienced hope, joy, inspiration, some frustration but, always, a challenge.

World War II began before I completed my college education and I participated in the conflict. When the war was over, I completed my education and prepared for a professional career. After some industrial experience, and teaching engineering at Rutgers, the State University of New Jersey, and at Virginia Polytechnic Institute and State University, I accepted a position with North American Aviation — now the Rockwell International Corporation — in California.

The company grew rapidly in the early 1950s and I advanced through a series of positions involving the development, design, manufacture, test, and support of both defense and space systems. This experience included work on such programs as the Navaho, GAM-77, and Minuteman missiles; the F-111A aircraft; the Polaris and Poseidon submarines; and the Apollo moon program — my specialty being in guidance and navigation systems. Following experience as a lead designer, supervisor, project administrator, and project/program manager, I became a member of the corporation's senior technical staff, reporting to the senior vice president of research and engineering at the executive offices, and focused on the establishment of corporate policy and direction. In addition, I served as a member of the company's Invention and Review Board, and the Product Planning and Business Committees.

In 1970, I was invited to join the Director of Defense Research and Engineering, Dr. John S. Foster, Jr., in the Office of the Secretary of Defense. Plans and Programs (to which I was assigned), was presided over by Mr. Edward L. Ball. I helped prepare the first edition of the major defense system acquisition directive (DOD Directive 5000.1) and develop directives and procedures in areas like configuration management, system engineering management, data management, and independent research and development.

During that period, I participated in preparation of the charter and establishing the Defense Systems Management School (DSMS) — an inspiration of the Honorable David Packard, then Deputy Secretary of Defense. After its founding and start-up activities, I accepted an invitation from the first commandant, Brigadier General Winfield S. Scott III, USA, to join the organization. I served as a member of the teaching faculty, chief of programs, chief of plans, advisor to director of plans and programs, acting chief of publications, associate and acting dean of administration, and senior member of the research and information faculty.

During my years in industry, and afterward in the Department of Defense, I have been an active member of The American Society of Mechanical Engineers, The Society of

Manufacturing Engineers, The American Society for Quality Control, The American Society for Engineering Education, The American Management Association, and Sigma Xi - the Scientific Research Society. Furthermore, I have served on government/industry working groups sponsored by the National Security Industrial Association, the Aerospace Industries Association, the Electronic Industries Association, and the American Defense Preparedness Association. I have been a visiting lecturer at the Army War College, the Naval Postgraduate School, the Air Force Institute of Technology, the University of California at Los Angeles, and The George Washington University. I am listed in *Who's Who* and *Who's Who in American Education*.

Because the subject has been a continuing concern and challenge to me, many of the books and papers I have been the author of are devoted to some aspect of managing the acquisition of defense and space systems.

For everyone who has been engaged in pursuing the best way to manage defense acquisition, I hope this book will bring back pleasant memories of the accomplishments and successes enjoyed. For me, it's been a fascinating, exciting and ever-challenging pursuit. To you taking up this pursuit, be assured the prospect of a brighter future is in your hands.

David D. Acker

McLean, Virginia
October 1991

FOREWORD

David D. Acker
October 12, 1921 – January 14, 1992

Dave Acker left a legacy at the Defense Systems Management College when he retired in December 1991 after 20 years. An accomplished writer and esteemed colleague, Dave's works will endure as long as this Nation develops and produces weapon systems for self-defense and protection of freedom. His many books, articles and papers are contributing significantly to an improved understanding of defense acquisition by students and users in the defense community.

Dave completed this work, *Acquiring Defense Systems*, shortly before his death in January 1992. It serves as an excellent and detailed reference and study piece on how we in defense acquisition have conducted business since World War II, with special emphasis on certain topics of deep interest to Dave, such as quality and ethics, which personified him as businessman, author, teacher and friend.

This work is published with pride and honor in memory of Dave. A special thanks to Esther Farria, Shelley Fink and Kay Sondheimer for their editing, administrative and production assistance.

Wilbur D. Jones, Jr.
Director, Defense Systems
Management College Press

July 1993

DEFENSE SYSTEMS MANAGEMENT COLLEGE

The defense systems acquisition environment entered the 1990s in significant turbulence with attendant major challenges for the DSMC. Implementation of efficiencies mandated by the 1989 Defense Management Review (DMR), the modified threat resulting from fundamental changes in eastern Europe and the Soviet Union, and large defense budget reductions had an affect on the way DSMC did business. Even the specific nature of DSMC business was impacted; but, the DSMC basic mission areas of acquisition education, research, information dissemination, and oversight of the total DOD acquisition education program continued and expanded.

In February 1988, the Honorable Robert B. Costello, Under Secretary of Defense for Acquisition, directed that:

> ...the mission of DSMC is expanded to include the entirety of acquisition management.

The scope and magnitude of this mission represented the greatest challenge to DSMC since its founding. The DSMC, as the Defense Department's premier joint acquisition management college, generally focused efforts on education, research and publications relating to program management and systems acquisition. The College broadened its horizons to maintain excellence in education and training in essential elements of defense acquisition management. The DOD acquisition system included all equipment, facilities, and services planned, designed, developed, acquired, maintained and disposed of by the Defense Department. The system extended to establishing policies and practices governing acquisitions, determining and priortizing resource requirements, directing, and reporting to the Congress. More explicitly, the Congress asserted that the acquisition workforce included all those involved in contracting, logistics, program management, systems engineering, production and manufacturing. The College undertook initiatives it believed would go a long way toward meeting the expanded challenge.

An Acquisition Enhancement Program Office was established to provide the Commandant and the Office of the Under Secretary of Defense for Acquisition full-time oversight for courses required for Service acquisition certification. It coordinated development and revision of these courses with acquisition educators throughout the DOD component schools, promoting high quality education while avoiding unnecessary duplication.

The DSMC Center for Acquisition Management Policy (CAMP) analyzed defense acquisition issues, problems, and policies, and recommended constructive changes. Their findings went to senior-level policy officials including the Department of Defense Acquisition Executive and other defense personnel, the Congress, acquisition policy-makers, acquisition executives of the military services, and the Policy Guidance Council.

Reductions in the size of the armed forces and recognition in the DMR and elsewhere of the need for the highest quality work force changed and increased demands on DSMC for education. The College ramped up its capability to provide the 20-week Program Management Course (PMC) to the increased number of students needed by the military services. The DSMC also developed an introductory-level course in program management, the Acquisition Basics Course, to meet Services' needs for educating people just entering the acquisition business. The College continued to investigate new and imaginative ways to meet Service needs at the four DSMC Regional Centers, permitting a more efficient and effective use of resources. Because of the dynamic environment of systems acquisition management, the demand for short courses changed. Responding to this environment, DSMC revised, updated, and added courses to stay on the cutting edge of the acquisition business. For example, the College became the DOD focal point for Total Quality Management (TQM) education and training. DSMC also developed a new course, "Systems Acquisition for Contracting Personnel." In the multinational arena, DSMC developed an "Advanced International Management Workshop" and concluded an "International Defense Education Arrangement (IDEA)" for cooperation with counterpart institutions in Europe.

Further keeping pace with defense acquisition, the College has continued to expand research in a variety of acquisition projects. Most visible products are more than 40 practical handbooks and guides for program and functional managers. The publications and reports containing results of acquisition research are used in the classroom. Because the information is current and carefully researched, these documents are in demand by DOD and industry acquisition professionals.

The *Program Manager*, a bimonthly journal published at DSMC, continues to broaden its circulation. It has captured the attention of the acquisition community by providing a critical link with program managers. The journal, which is also read by people in the Executive Office of the President, the Office of the Secretary of Defense, the Service headquarters staffs, the Congress, and industry serves as an effective communication channel for the presentation of new concepts, policies, and practices in managing defense acquisition.

In 20 years as the center for system acquisition management education in the Department of Defense, the College earned a worldwide reputation within government and industry for the excellence of its education, research, and information dissemination programs. This reputation was gained by a disciplined adherence to a basic mission and rapidly and comprehensively adapting DSMC programs to changes in the acquisition process resulting from executive and legislative branch initiatives. The DSMC will continue this proven approach so that, in the world of the College vision statement:

> DSMC will create an atmosphere of quality which fosters personal growth, professional development and empowerment of its people and its customers; by the 21st Century we will be the Department of Defense focus of excellence in acquisition education, research, and information dissemination. We will enhance public confidence by leading continuous improvements in the acquisition management process throughout Congress, the Department of Defense, and

defense industry. Through high quality service to the entire range of customers, we will be recognized by lawmakers, policymakers, and decision makers as the preeminent academy of acquisition management.

At DSMC, we are committed to ensuring that members of our military services and associated civil servants in the defense acquisition business have the necessary expertise to manage defense systems effectively. This will ensure that our soldiers, sailors, airmen, and marines are equipped with highly reliable, supportable and effective weapons systems.

May we strive for excellence and achieve it – but avoid the pitfall of arrogance.

May we develop integrity – but avoid the pitfall of pomposity.

May we develop fortitude – but avoid the pitfall of becoming hardened.

May we broaden our appreciation of scholarly activities in fields other than our own. In our world of polarizing dimensions, may we not permit scholarship to divide us.

May we develop a sense of humor and never lose it.

May we understand what we have done and reflect upon the implications of our results.

May we not only take time to reflect – but may we also take time to dream.

May we dream of what is possible.

Then, may we act.

– Based on original thoughts of
Fredrick H. Shaw
President, Sigma Xi
June 1991

Four Decades of Design and Evolution of Defense Systems Acquisition Management

Introduction

The Concept of Defense Preparedness

The basic objective of defense spending is preparedness. Accordingly, the maintenance and upgrading of current defense systems, as well as procurement of major new defense systems, represent a significant activity of, and cost to, the Department of Defense (DOD). Through the years, threats caused differing political philosophies in the international arena, and the constant pressure to contain costs has resulted in increased attention on the defense systems acquisition process — a process that, since its inception in the late 1950s, has depended on a close working relationship between the DOD and industry.

During World War II, government-industry teamwork enabled this nation to become the "arsenal of democracy." We fulfilled our requirements for defense systems in a profit-motivated, free-enterprise environment. President Dwight D. Eisenhower, in his farewell address to the nation in January 1961, pointed out that the United States was facing a hostile ideology; therefore, the military establishment must provide a "vital element in keeping the peace." "Our arms must be mighty, ready for instant action, so that no potential aggressor may be tempted to risk his own destruction," he said.

The United States didn't really have "an armament (defense) industry" until after the Korean conflict, Eisenhower explained. In previous wars this country had been able to convert from the production of "plowshares" to "swords" in time to meet any national emergency. At the start of the 1960s, Eisenhower found this approach to be no longer viable. A return to the plowshares to swords approach would have been unwise because of the growing technical complexity of our defense systems and equipment; the long lead times required for design, development, production and testing, and the attendant increased costs of defense systems. If the United States had returned to the *in extremis* approach to national defense, it would have left our country vulnerable to would-be aggressors.

Eisenhower felt that "the councils of government...must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex." Citizens in and out of government shared his concern and worried that a community of interests might develop that could influence the magnitude and direction of our domestic and foreign policies. Included in this community — the military-industrial complex — were corporation executives, military officers, civilian bureaucrats, congressmen and others. At the center of the community was the unique relationship between the DOD — the customer — and the companies in the defense industry — the contractors. Some patriotic citizens went so far as to say we had progressed from an arsenal of democracy to a military-industrial complex composed of a group of people concerned with only their own interests and welfare.

The question that required an answer in the early 1960s was this: Are government and industry keeping each other in check, or are they acting in concert to reinforce one another? In other words, would the DOD-industry teams coalesce to the point that they would be free to operate without constraint? Were this to happen, the traditional balance normally maintained by our political system would be jeopardized. The answer, of course, was – and still is – that the traditional checks and balances will remain intact.

The Concept of Program Management

During the 1950s and 1960s, the concept of program management – the technical and business management of selected tasks using a centralized management authority – evolved from the need for an organized approach to managing the defense systems acquisition process. This process consists of a complex cycle that commences with identifying a need and conceiving a system to satisfy the need. The cycle ends – following deployment (and possible modification) of the system – with the retirement of the system from the inventory, or the expenditure of the system in service, as in the case of an air-to-air missile. A program – for our purposes – may be considered as an aggregation of controlled, time-phased events designed to accomplish a definite objective. Often a program involves a pyramid of contractually interrelated government, contractor, subcontractor and supplier organizations for long periods of time. In this complex environment, the performance of an organization can affect others. Procurement methods and practices present a formidable challenge to the government-industry teams established to manage programs. Experience gained since the Korean conflict indicates that successful completion of a program depends not only on the contractual environment, but also on an understanding and proper application of a number of management systems developed by the DOD and industry.

Beginning in the late 1950s, the framework for program management may be attributed to the Air Force Systems Command when it published a series of regulations popularly referred to as the "375 series." These regulations and the accompanying manuals originated in missile/space programs, where failure could not be tolerated. The 375 series went into detail on how systems acquisition should be managed from formulation of a system concept until "phase-out."

As program offices for managing the systems acquisition process were organized through the Services, the nature of the offices took a variety of forms. Some offices were highly integrated and self-supporting; some were of a matrix type; others were highly-staffed and dependent upon a permanent functional staff for their support. The concept of a program office to manage the development and production of a system proved to be sound; however, some offices were hampered in their activities by management layers, either by the Service involved, or by their own functional and/or supporting staffs, or by both.

Every program, regardless of its size or the nature of the defense system involved, exhibits certain factors in common with other programs. For example, a program generally contains five[1] distinct phases in its life cycle: (a) exploration and development of alternative defense system concepts based on a recognized mission element need; (b) demonstration and

validation of selected alternative concepts; (c) design, development, limited production, test and evaluation; (d) production; and (e) Service deployment, operation and operational support of the defense system. The fifth phase may also include product improvements, planned and unplanned. Within each phase are discrete and specific events that must occur before the program advances to the next phase. The program life cycle represents a meaningful and understandable framework into which virtually every action, event, document, responsibility and authority bearing upon the management of the program can be fitted. Figure 1 depicts the evolution of the major defense system acquisition life cycle over the years.

When the contract for a program is negotiated and signed, it represents, in an implied sense, a partnership agreement between the customer and the contractor. By awarding the contract, the customer does not relinquish responsibility for program performance; therefore, the customer must know how the contractor is managing the project. For example, the contractor's organization is of concern to the customer, but to a lesser degree than the operation of his system for planning, scheduling and controlling the project effort. The contractor's system for allocating resources, authorizing work, and evaluating its own and subcontractor performance are vital customer concerns.

National security objectives provide the guidelines for initiation of new defense systems projects and the continuation or deletion of existing projects. These objectives are derived from many sources: presidential statements; National Security Council deliberations; intelligence reports and estimates; and national and international political, economic, military and social factors.

Now, let's examine how the process of defense systems acquisition has matured and how it has been affected by the changing management philosophies for conducting DOD business through the past four decades.

The Decade of the Fifties

Following a low volume of major defense systems business after World War II (the late 1940s), the Korean conflict and the general deterioration in the international situation led to an expansion in the development and production of defense systems. During the latter half of the 1950s, defense systems sales were stable, and a gradual transition from long production runs to more research, development, test and evaluation began to take place.

The process of procuring major defense systems in the 1950s was complex. The military projects lasted many years and consumed large amounts of money. Nevertheless, the basic process for procurement of defense systems included all functions that normally pertain to the acquisition of goods or services; that is:

– Preparation of a description of the requirement (need)

– Solicitation and selection of sources

– Negotiation and award of a contract

– Activities involved in contract administration.

The key steps in the procurement process from the 1960s through the 1980s are illustrated in Figure 2. In a specific procurement, the variables such as (1) statutes and regulations that apply and (2) the urgency of satisfying the requirement may impact the actions to be taken in each step and/or the sequencing of the steps.

During the 1950s, defense business was characterized by rapidly advancing technology; concurrency in design, development and testing; and cost-plus-fixed-fee contracting. Emphasis was on the development and production of defense systems that incorporated the most advanced technological innovations. This, of course, led to a high risk of failure.

Money was authorized to develop almost any new defense system that appeared capable of giving the United States a performance advantage over any potential adversary. Such considerations as "should-cost," "design-to-cost" and "life-cycle cost" were not uppermost in the minds of the defense systems planners until the late 1950s. Development and production were carried out under cost-reimbursement contracts. In this environment, production costs did not pose a major constraint on engineering design. When a design was discovered to be impractical in production, or inoperative in field use, it was modified in accord with government-funded engineering changes.

Toward the close of the 1950s, a new trend began to appear. The government began to look over the shoulders of the defense contractors. It was when the United States accelerated its pioneering program in ballistic missile development and production. The high risks and costs of these programs, which employed concurrency of development and production, could not be borne by industry alone. Heavy reliance had to be placed on sole-source procurement, because competitive capabilities had not been developed. By 1960, for instance, a majority of the contract awards made by the Air Force were noncompetitive, and more than 40 percent of the awards were cost-plus-fixed-fee contracts.

The DOD did not have an orderly, integrated planning, programming and budgeting system during this decade. Although James V. Forrestal, the first Secretary of Defense (SECDEF), took steps to create a uniform budget structure for use by the military departments, the planning and budgeting by each department was carried out in relative isolation from the others. Consequently, the plans prepared by each military department were based on (1) the kind of war that department envisioned, and (2) reliance of that department on its own resources. This led to overlapping functions, duplicating missions, and occasional capability omissions.

Military planning was hardware-oriented and looked ahead five years. On the other hand, military budgets were separated into appropriation categories (input oriented) and unconstrained

by the Office of the Secretary of Defense (OSD). As a result, military departments tended to submit budgets that were higher than either the SECDEF or the Congress could accept. The OSD budget, prepared by the Comptroller, considered fiscal realities, but only projected requirements for one year in advance. The Director of the Budget in the Bureau of the Budget (now the Office of Management and Budget) established the final defense budget. Several changes were needed to correct the problems and bring about an integrated process:

- An orderly, coordinated system had to be developed

- The OSD had to provide fiscal guidance to the military departments

- Planning had to be guided by OSD, and communication between the military departments had to take place

- Planning, programming and budgeting had to be focused on national security objectives over a specific number of years

- Better communication with the Bureau of the Budget had to take place.

The lack of a well-organized and integrated DOD financial management system, along with the practice of "piecemeal" procurement, led to unstable employment in the defense industry and the emergence of a transient work force. Many of the contractors being challenged to develop and produce defense systems on the outer fringes of technology found it difficult to create and maintain smoothly functioning project management teams.

During World War II, defense industry had become a significant factor in the economy of the United States. The DOD budget had grown to about 50 percent of the federal budget. It continued to be a major part of the federal budget while the defense systems acquisition projects were being conducted to support the Korean conflict and a limited number of military assistance/grant aid agreements with allied countries. The military assistance program (MAP) continued throughout the 1960s and 1970s, but at a much lower level. Today there is some sentiment in the Congress to phase out the MAP altogether. The foreign military sales (FMS) program, involving the sale of U.S. military goods and services, as well as training, to U.S. allies, has continued since 1950. According to the Foreign Military Sales Act, as amended in 1968 (Public Law 90-629), the United States was to be reimbursed for not less than the value of the goods and services being transferred. Further, all costs, including a reasonable contribution to sunk investment costs, were to be recouped. In the amended act, FMS became the responsibility of the International Security Agency (ISA) – an agency geared more to meeting demands by selling from the inventory than to procuring major defense systems for allies through the defense systems acquisition process.

As the transition from military aid to military trade was taking place between the United States and its allies, European members of the North Atlantic Treaty Organization (NATO) began to see the need to develop and protect their industrial bases – particularly those members

capable of developing and producing defense systems. With this as a backdrop, and because of the high cost of developing, producing and fielding new defense systems, the tendency to form multinational corporations grew.

The Decade of the Sixties

The defense systems acquisition environment began to undergo marked changes in the early 1960s. After a decade of experience with the acquisition of high-technology defense systems, DOD attention began to shift toward integrated planning and programming, and to using available resources more efficiently throughout the defense systems acquisition process.

On January 21, 1961, Robert S. McNamara, a former corporate executive, became Secretary of Defense. During his first year in office, he decided to centralize the authority and planning for the defense establishment at the level of the Office of Secretary of Defense and to decentralize operations. Although centralization of the planning and operational decisions came about, decentralization of operations was not realized during his term of office.

The Five Year Defense Program

Among the beneficial changes introduced by McNamara was the Five Year Force Structure and Financial Plan, better known as the Five Year Defense Program (FYDP). The FYDP was a register of all currently approved programs, along with their funding and manpower levels. Serving as the pivot of the entire defense programming system, it grouped all military forces and all defense systems according to their principal missions, without regard for Service affiliations. In the FYDP, resources (inputs) — manpower, defense systems, and installations — are related to the military functions (outputs).

The 10 major programs of the FYDP are listed in Figure 3. Programs 1 through 6 and Program 0 had a force-mission or combat-mission orientation. Programs 7, 8 and 9 had a support orientation. Because program resources overlapped various management areas as well as the functional responsibilities, no one program remained the exclusive responsibility of a single Assistant Secretary of Defense.

The major force programs of the FYDP were composed of program elements. These elements were the smallest units of military output controlled at the OSD level. Each element constituted an identifiable military capability that contributed to the mission of a major project. Costs are measured in terms of the amount required to finance the project element in a given year. By 1980, there were about 1,100 program elements serving as basic building blocks in the programming process.

In addition to the major programs of the FYDP, OSD and the Services used functional programs — such as the Telecommunications and Command and Control Program; the Communications Security Resources Program; or the General Defense Intelligence Program — to manage certain resources that cut across program element or appropriations boundaries.

The FYDP was updated three times a year. The most important update occurred in January when the document was revised to reflect the President's budget. This edition of the FYDP served as the DOD planning and programming baseline for the ensuing year. In May or June, each Service Secretary approved the program objectives memorandum (POM) prepared by his organization for the next budget cycle, and OSD issued an update to the FYDP to reflect the Service POM inputs. In September, the SECDEF concluded his review of the Service POMs and revised the Service programs, as necessary. The OSD then issued another update to the FYDP reflecting the SECDEF program decisions with respect to the POMs. This issue of the FYDP was used in negotiations with the Office of Management and Budget prior to the first of January, and served as the basis for the creation of the Service budgets to be forwarded to the Congress the first of January. In January, the cycle began again.

In October 1965, McKinsey and Company initiated a study to determine how to improve the programming process in DOD. Based on the results of this study, the SECDEF began the annual programming cycle by publishing a list of major force-oriented issues that would have major impact on our armed forces. To prepare this list, the SECDEF used the military guidance provided by the Joint Chiefs of Staff (JCS) in the joint strategic objectives plan (JSOP) and the advice of the OSD systems analysis organization.

In addition to the listing of issues, the SECDEF initiated the draft presidential memorandum. This document, treated as a privileged communication from the SECDEF to the President, covered the tentative programming events being considered by DOD during the next fiscal year.

In 1968, the SECDEF began the annual issue of logistics guidance and 18 other guidance memoranda. Soon after, the SECDEF issued the first development concept papers (DCP), which will be discussed in more detail later.

The Planning, Programming, Budgeting System

To make the FYDP work, McNamara introduced another management tool – the planning, programming, budgeting system (PPBS) (Figure 4). The SECDEF recognized that realistic force planning must be based on the military strategy the United States wishes to follow in accomplishing national security objectives. In the development of a suitable force structure, fiscal, manpower, research and development and production, constraints must be applied. Also, adequate consideration must be given to the risks imposed by resource constraints. The PPBS took these factors into account, and served as an integrated system for establishment of the annual DOD budget and the periodic revisions to the FYDP.

An examination of the PPBS revealed that it was a cyclic process containing five distinct, but interrelated, phases, namely: (1) planning, (2) programming, (3) budgeting, (4) executing the programs approved by the Congress, and (5) maintaining accountability and reporting results. The fifth phase also included preparing future plans, programs and budgets, as well as supplying financial status information to DOD managers.

The broad categories of major programs – upon which the planning was based when the PPBS was introduced – were sometimes referred to as the "Hitch Program of Packages," after Charles J. Hitch,[2] then Assistant Secretary of Defense (Comptroller).

From 1961 to 1969, the PPBS was a centralized decision-making activity with McNamara, Hitch, and Dr. Alain C. Enthoven acting as principals. As in the 1950s, the programs submitted by the military departments contained no fiscal constraints. Thus, the budgets were unrealistic and, in most cases, had to be severely slashed at the OSD level. With time serving as a critical factor, OSD management had to make significant program decisions without giving the military departments an adequate opportunity to defend their plans, programs or budgets.

In 1969, the PPBS was modified by the new SECDEF, Melvin R. Laird, to permit some decentralization of the decision-making process. The SECDEF requested that the program and budget submissions made by the military departments fall within the explicit fiscal constraints he would establish annually. From that time on, fiscal guidance became the principal constraint on the military departments during the development of their plans and budgets. The departments recommended the total program objectives – in a program objectives memorandum – for the forthcoming budget year and the four subsequent years within explicit fiscal constraints. This change to the PPBS shifted competition for financial resources from OSD to the military departments and into the programming phase of the PPBS.

The program objectives memorandum was a document prepared by each military department and defense agency in a prescribed format for submittal to the SECDEF. The document contained a recommendation covering the total resources required by the department or agency within the parameters set forth in the SECDEF's fiscal guidance. To develop the POM, each military department and defense agency had to determine how it proposed to allocate and prioritize limited resources in a multimission environment among competing needs to maximize combat capability. Included in each POM is an assessment of the risk associated with current and proposed forces and support programs.

Systems Analysis

During his eight-year term, McNamara introduced to DOD another management process – systems analysis. This process, which was to become an integral part of the PPBS, had been known in the industrial world as "cost-effectiveness study." An OSD office was created and given responsibility for conducting studies and analysis of the resources required, in terms of cost, to accomplish specific defense objectives.

Dr. Enthoven, who was appointed to head a small systems analysis section in the Defense Comptroller's office in 1961, became the Deputy Assistant Secretary of Defense (Systems Analysis) in the fall of 1962, and the Assistant Secretary of Defense (Systems Analysis) in September 1965. Throughout this period, Dr. Enthoven's office was the primary action office for the major force-oriented issues. The Office of the Joint Chiefs of Staff served as the office for collateral action. The military departments and defense agencies were given responsibility for reviewing and commenting on proposed plans and programs for dealing with critical issues affecting U.S. security.

Hitch encouraged industry to conduct independent studies and analyses to determine what contributions it might be able to offer to improve existing defense systems and to provide suggestions for new ones. By such efforts, Hitch believed that industry would be able to anticipate some of the DOD decisions regarding the future content of the FYDP.

The systems analysis approach advocated by McNamara had worked well in the industrial world where its success or failure could be determined by profits. In the DOD environment, however, it was difficult to determine the effectiveness of each decision. While difficult to determine, cost-effectiveness had to be measured to deal with the problem of limited resources. Unknowns, such as how much "security" additional quantities of a specific defense system will provide, limit management's ability to determine precisely the correctness of a decision. There is no known way to assign a price to such a decision. The big question to be answered by defense planners and decision-makers will always be: "What types and quantities of defense systems are required to meet the national security objectives within available resources?"

At the close of McNamara's term in 1969, the FYDP and the PPBS were firmly established. The FYDP and the PPBS brought some order to the annual budget cycle and, with the adoption of systems techniques, improved the process of allocating scarce resources. Although some participants were not completely satisfied with the effectiveness of the McNamara approach, it did help to bring the DOD mission into conformity with overall national security objectives.

Contract Administration Organization

In the early 1960s, each military department had its own contract administration Service organization composed of a headquarters office and several field offices. The field offices were organized by function, commodity or geographical area. Because this appeared to be a cumbersome arrangement, the ASD (Installations and Logistics) launched Project 60. The purpose of this project was to develop a plan for an effective DOD-wide contract management organization. The project was completed in 1963 and the present DOD contract administration structure is an outgrowth of the recommendations made in the final report.

Harvard Study

In 1962, the Harvard Weapons Acquisition Research Project report covering 12 major defense systems showed that, on the average, the quality of the defense systems being produced tended to exceed their original specifications. This quality was being achieved at the expense of development time (development time was averaging 36 percent longer than predicted), and costs (costs were averaging as much as seven times more than originally estimated). To rectify this situation, OSD management issued the following directions:

- Make defense system costs equal in importance to both performance and scheduled delivery to the inventory
- Eliminate "gold plating"

– Increase competition at the start of a new project

– Reduce the number of cost-type contracts, particularly cost-plus-fixed-fee contracts.

This report was favorably received by OSD. Corrective actions were taken. A dramatic reduction in the number of cost-plus-fixed-fee contracts took place. Incentive and fixed-priced contracts became the vogue to facilitate competition. The contracts took into consideration the technical risks the contractors had to assume, as well as the resources (men, machines, money and facilities) required.

Life-Cycle Cost

Life-cycle cost (LCC) – the total cost of acquisition and ownership – became a consideration in defense systems acquisition in the early 1960s when the Logistics Management Institute, under the sponsorship of the ASD (Installations and Logistics), conducted an investigation and recommended that the concept be applied to defense programs. At the outset, it was applied on procurements at the equipment level. Following issuance of DOD Directive 4100.35[3] – which was devoted to planning for integrated logistic support – and a tightening of the defense budget, application of LCC at the systems level became a requirement to support planning. Several major defense systems projects, such as the Navy LHA, the Air Force F-15 and the Army SAM-D, employed some type of life-cycle costing technique on a trial basis. Issuance of the following directives accelerated the adoption of life-cycle costing on all major projects:

– DOD Directive 5000.1[4], which changed the mode of defense systems acquisition

– DOD Directive 4105.62[5], which made life-cycle costs one of the principal considerations in the selection of contractual sources for major defense systems.

– DOD Directive 5000.28[6], which made design-to-cost a major acquisition policy. According to this directive, "The LCC of a system is the total cost to the government of acquisition and ownership of that system over its full life. It includes the cost of development, acquisition, operation, support and, where applicable, disposal."

The influence of time on a program manager's ability to curb costs is dramatically illustrated in Figure 5.

Concept Formulation and Contract Definition

In July 1965, OSD issued a directive requiring concept formulation and contract definition phases precede the engineering development phase of each major project.[7] Concept formulation phase activities were to include accomplishment of comprehensive system studies and development of experimental hardware; contract definition (formerly referred to as the project definition phase in the previous issue of this directive[8]) was the period during which preliminary design and engineering were to be verified or accomplished and firm contract and management

planning were to be performed on a project. Before proceeding with the engineering development phase of a new project, the project had to be accepted as part of the FYDP.

Total Package Procurement

In the mid-1960s, successful development contracts were generally followed by production contracts with little or no likelihood that the contracts would have to face competition. To ensure this, contracts based on the initial competitions started to include, along with the development effort, requirements for substantial production quantities. Observing this trend, Robert H. Charles, ASD (Installations and Logistics), conceived the total package procurement (TPP) concept. The objectives of this concept were as follows:

- Limit or eliminate "buy-in" considerations
- Motivate contractors to design for economical production, and minimize any tendency for production redesign
- Encourage subcontracts with, and obtain components from, the most efficient supply sources
- Encourage contractor efficiency through competition, and thereby reduce costs.

According to Charles, TPP would allow the government, like any buyer in the commercial world, "...to make a choice between competing products on the basis, not of estimates, but of binding commitments concerning performance and price of operational equipment."[9] It established these commitments competitively for as much of a project as practicable, and then permitted the winning contractor's profit ultimately to be determined under an incentive arrangement that related opportunity to risk. Profit was targeted initially in competition and was finally determined by product quality and the efficiency of the winning contractor.

The TPP concept fell far short of its goal. Cost overruns continued, new defense systems failed to meet technical performance requirements, and schedules slipped on many programs. The reasons for the failure of the TPP concept are many. The "heating-up" of the economy and the onset of inflationary pressure — both unrelated to a specific program — may have been partially responsible for the failure of the TPP concept. More importantly, the concept did not provide contractors with sufficient management flexibility to cope with all of the problems as they became known. Contractors had to make substantial production commitments to meet delivery schedules before completion of design and verification by testing. Costly redesign and rework followed. Continued trade-off analysis was stifled because of the rigidity of the contracts.

Although the Air Force Maverick air-to-surface missile project was successful using the TPP concept, serious problems were encountered on many other projects. Among those running into trouble were the Air Force Galaxy transport (C-5A) and short-range attack missile (SRAM), the Army Cheyenne helicopter (AH-56A), and the Navy destroyer (DD-963). As a result of the problems encountered, DOD recognized the need to place stringent limitations on the application of TPP. Perhaps the most important limitation was ensuring that the estimates of future service

demands, military threats, and technology were sufficiently accurate to allow pricing options on proposed defense systems acquisition projects to be evaluated adequately before project initiation.

Plea for Disengagement

Early in 1965, industry made a plea for disengagement from a number of government-imposed management systems. Contractors, through the industry associations, voiced concern about the proliferation of management systems imposed on defense systems projects and the growing number of reporting requirements. Industry deemed this trend to be inconsistent with fixed-price or incentive contracting. It questioned how the customer (government) could review and approve contractor actions without seriously weakening either the contract incentives or the warranties. Industry made the case that, when the customer chose to exercise detailed management of a project, the customer should share the success or failure of the contractor's performance with respect to incentives and fixed-price limits.

New tools had to be found that would provide the customer with "visibility," while not interfering with contractor prerogatives. The Aerospace Industries Association formed a Systems Management Analysis Group (SMAG) to investigate the problem. Highlighted in the resulting report of this group, issued in May 1966, were the conflicts between existing DOD management systems; the need to match appropriate management systems with the type of contract selected for a given defense system project; and the need to tailor the degree of management to the complexity of the project involved. The report urged that steps be taken to ensure any new management system was worthwhile in light of the expense involved in its application, consistent with those management systems already adopted for use by DOD, and in consonance with overall DOD policy.[10]

The force of the industry pleas led to the release of DOD Directive 7000.1 in August 1966, concerning resource management systems of the DOD.[11]

Resource Management Systems

In September 1965, Dr. Robert N. Anthony of Harvard succeeded Hitch as ASD (Comptroller). Upon the appointment of Anthony, the SECDEF assigned to him the task of bringing an accountability feature into the PPBS and providing some government "disengagement." This was accomplished by development and implementation of resource management systems (RMS). The RMS minimizes requirements for information while obtaining the data essential for program management purposes. Where possible, RMS makes use of contractors' internal systems and reporting procedures, thus avoiding the imposition on contractors of unnecessary reporting burdens.

The principle resource management systems are as follows:

– Programming and budgeting system – the process of establishing goals and determining the resources needed to reach the goals

– Managing the acquisition, use and disposition of capital assets

– Managing the acquisition and disposition of inventory and similar assets

– Managing the resources for operating activities; i.e., the combat forces and their associated support.

The resource management systems were not only oriented to the needs of management, but they provided information required by the Bureau of the Budget (now the Office of Management and Budget), the Treasury Department, and the Congress.

The ASD (Comptroller) was made custodian of all resource management systems. Those systems related directly to financial control or reporting were made his direct responsibility; the other management systems were made subject to his approval. Additional DOD directives and instruction in the 7000-series, relating to management and control systems, were issued in the late 1960s and early 1970s.

Selected Acquisitions Information and Management System

In 1965, Anthony recognized the need to develop an integrated approach to financial management for major defense systems acquisition. The problems rampant at that time were proliferation of systems and reports, the cost of operating the system, lack of capability to make adequate cost estimates, the lack of adequate contract status information, and the lack of cost control.

Industry, through the representation of major industrial associations in the Council of Defense and Space Industry Associations (CODSIA), collaborated with DOD in the development of a selected acquisitions information and management system (SAIMS). The SAIMS – a subsystem of the resource management systems – was born in December 1965. This new system followed the approach of getting information from the contractors' management control systems in a form DOD managers could use to support planning and to evaluate contractor progress. The SAIMS, which continued to evolve over the next three years, provided DOD and industry project management with economic impact analysis. It provided information for estimating costs of new projects, follow-on procurement and major project changes, pricing and negotiating, funds management and performance measurement. The relationship of SAIMS to RMS is illustrated in Figure 5.

During the defense systems acquisition process, only three kinds of financial information are required by DOD management from industry, namely:

– Funding information for budget preparation and update

– Historical cost data for use in estimating costs on new defense systems programs, or extensions of existing programs

– Contract performance information to assess contract status, evaluate performance trends, and provide early visibility of cost and schedule problems.

All contractually related financial management reporting emanates from a contractor's internal system; therefore, it is necessary to ensure the contractor's system is sound and provides reliable data. The criteria set forth in DOD Instruction 7000.2 were established as standards of acceptability.[12]

Application of cost/schedule control systems criteria on a defense system acquisition project provides the project manager with better visibility and controls for achieving cost, schedule and performance objectives. It also provides the government project manager with the following:

– A means for recognizing previously unidentified problems on the project

– An ability to trace the problems to their source

– A method for determining the cost impact that will be created by the problems

– An objective, as opposed to subjective, assessment of project status on a periodic basis.

From the viewpoint of the contractor, two benefits are to be gained from application of a cost/schedule control system to a project. These benefits are an improved overall system discipline, and a more detailed planning and budgeting process.

Selected Acquisition Reporting System

In 1967, a system involving the preparation and presentation of reports on selected defense systems projects was conceived by Anthony. The objective of this internal DOD reporting system – released as DOD Instruction 7000.3 early in 1968 – was to summarize technical performance, schedule and cost information on "selected" major defense system projects.[13] Submitted quarterly, each selected acquisition report (SAR) provides the SECDEF with program visibility and progress, and identifies specific problems relating to meeting designated performance, schedule and cost targets. Management attention is focused primarily on exceptions to the project plan and breaches of project thresholds established in the development concept paper (DCP), later known as the decision coordinating paper. The SAR system closed the feedback loop on major defense systems projects by comparing actual with planned accomplishments.

In April 1969, the SAR became the vehicle for providing the Congress with the status of major defense systems projects. In 1975, through passage of Public Law 94-106, the SAR became the legal document for providing standard, comprehensive summaries of the status of selected defense systems projects to the Congress at the end of each quarter of the fiscal year.

Should-Cost Analysis and Pricing

In the late 1960s, defense officials began to express their concern about the adequacy of the pricing techniques used in sole-source procurements. They recognized that when there were no competitive forces at work, there was a tendency for contractors to be liberal in their cost estimates. This tendency appeared to be especially prevalent when costs were being estimated beyond 1 year. Defense officials reached general agreement that contract prices must reflect economical and efficient performance practices, as well as realistic costs. To bring this about, government contract negotiators had to learn how to recognize a realistic contract price – a figure based upon what the project should cost when the contractor was performing with reasonable economy and efficiency.

To meet the problem head-on, Anthony sponsored the development of a new pricing technique. This technique, identified as "should-cost analysis," consisted of an in-depth analysis of a contractor's management, cost-estimating and production practices. In addition, the effects of poor performance were identified and measured using standard industrial engineering techniques. The findings were used to develop a baseline for pricing. The price excluded the costs resulting from inefficient practices. The should-cost analysis and pricing technique, based upon the coordinated efforts of a team of government engineering, pricing, procurement, auditor and management specialists, proved to be effective in fostering long-range improvements in industrial practices and in setting more realistic contract prices.

Other Major DOD Directives

In the mid- to late 1960s, several additional major policies/directives were issued by DOD that relate to the defense systems acquisition process. Although they will not be discussed in detail, the subjects covered are worthy of note:

– Development of integrated logistic support plans for systems/equipment; i.e., the integration of logistics considerations and logistics planning into the systems engineering and design process

– Proposal evaluation and source selection

– Defense standardization program; i.e., a program to control item proliferation

– Quality assurance; i.e., the enforcement of technical criteria and requirements governing all material, data, supplies and services developed, procured, produced, stored, operated, maintained, overhauled or disposed of by or for DOD

– Selection and application of management control systems in the acquisition process

– Value engineering program; i.e., a program to eliminate or modify unessential characteristics and minimize cost through the organized use of value engineering

— Technical data management; i.e., the standard way of doing business when contractor-prepared data are required by functional managers in various functional areas. Data requirements result from, and are subservient to, related tasks in the statement of work

— Configuration management; i.e., a discipline applying technical and administrative direction and surveillance to (1) identify and document functional and physical characteristics of a configuration item, (2) control changes to those characteristics, and (3) record and report change processing and implementation status

— Work breakdown structure (WBS); *i.e., a product-oriented family tree completely* defining the program. It is composed of hardware, software, services and other work tasks that result from engineering efforts during development and production of defense systems or equipment. The WBS displays and defines the products to be developed/produced and relates the elements of work to be accomplished to each other and to the end product.

Lessons Learned

During the 1960s, several lessons were learned beyond those cited, namely:

— The acquisition process lacks timeliness and flexibility in responding to world threats.

— Paper studies cannot adequately establish that the technology needed for a new defense system is at hand. Breadboards, brassboards or other hardware demonstrations of *feasibility reduce the margin for error. When resources are scarce,* hardware demonstrations may have to be limited.

— Trade-offs between performance, cost, and schedule, with the objective of achieving the right balance between performance and cost, should be made prior to the engineering development phase of a project's life cycle.

— Planning for integrated logistic support — the composite of all the support considerations necessary to ensure the effective and economical support of a defense system throughout its life cycle — should begin prior to the engineering development phase.

— The period in which design takes place is not the right one for discovering and implementing untried technology; rather, it is the time for integrating known technology.

— Specification requirements should be simplified and limited throughout the acquisition process, and use of applicable existing industrial standards, specifications and hardware should be increased to minimize costs.

— Independent parametric or comparative pricing techniques should be used to achieve more realistic costing.

— Both parties to a contract should have a reasonable time to examine the technical package and discuss it before any commitments are made.

– There is no substitute for competent and objective surveillance of critical program elements on a continuing basis.

International Environment in the 1960s

In the early 1960s, U.S. foreign policy, *vis-à-vis* Europe, shifted from military aid to military trade. As the decade advanced, European countries became more self-reliant as their prosperity increased. Europe redeveloped a portion of its technology base, located and developed markets in the Third World, and began to compete with the United States in specific facets of the defense business.

Growth of European defense industry created a number of problems – military, economic and political.

– Militarily, the growth of European industry led to destandardization. This resulted in some major problems. For example, when U.S.-built systems and equipment were replaced with European-built items, logistical problems developed.

– Economically, growth of European industry – in a collective sense – enabled our allies to compete with the United States in Third World markets.

– Politically, as European defense industrial bases became institutionalized, nationally and transnationally, the United States began to feel a challenge from its allies.

When foreign customers procure major defense systems still in development or production, fixed (nonrecurring) costs can be spread over a large base, through reducing the U.S. unit costs and the total costs of ownership. However, several less-obvious factors, such as the creation of a need for excessive overtime when U.S. negotiators settled for over-ambitious delivery schedules, impact the U.S. projects.

Recommendation for Legislative Action

In the late 1960s, industry believed major changes were needed in the Armed Services Procurement Act of 1947 and the Armed Services Procurement Regulation. It was the prevailing viewpoint in industry that the attention and emphasis needed to improve the process could only be achieved through congressional hearings, followed by appropriate legislation. John P. Elliott of the Western Electronic Manufacturers Association – now the American Electronic Association – in an appearance before Representative Chet Holifield's Military Operations Subcommittee of the House Committee on Government Operations in June 1969, called for establishment of a Commission on Government Procurement.

Appearing before the same subcommittee of the House of Representatives shortly thereafter, Karl G. Harr, then president of the Aerospace Industries Association, urged support of the proposed bill to establish a Commission on Government Procurement. During his

appearance, Harr took the opportunity to place the relationship of government to industry in perspective. He said:

> ...in the government-industry interface there are fundamental differences in emphasis. The system requires that this be so. Two basic principles underlie that interface. Both sides subscribe to both of these principles, but each side of the interface bears a different primary mandate. The government procuring agency has as its primary responsibility the acquisition, in the most efficient manner, of the best possible goods and services in support of national programs. Industry supports this principle. Industry on the other hand bears the primary mandate of doing the best job of which it is capable, again in the most efficient manner. The government subscribes to this principle.
>
> Despite the apparent compatibility of these two points of view...these principles are not necessarily...wholly reconcilable in the tens of thousands of applications which today's large government/industry interface requires.... Threading one's way through today's complicated and complex procurement environment in such a way as will at all times preserve our basic principles and objectives in optimum fashion, and give full vent to the collateral factors which must be considered, is about as sophisticated a challenge as any among us has to face.[14]

The Congress was receptive to the industry recommendation, and a commission was created in November 1969. The commission was given a charter to study the government procurement policies and practices and to recommend to the Congress any changes to them that would promote efficiency, economy and effectiveness in the procurement process. The findings and recommendations of the commission presented to the Congress in 1972 are discussed later.

The Period of Transition: Late 1960s to Early 1970s

In 1969, the Congress displayed some preoccupation with the economy, the environment and energy. This preoccupation, along with the growing sentiment to fund social programs, the disenchantment with the conflict in Vietnam, and the escalating costs of defense systems projects, led the Congress to make the defense effort the primary target for budget cuts.

To respond to this situation, Secretary of Defense Melvin R. Laird and Deputy Secretary of Defense David Packard initiated a number of actions aimed at improving the management of the defense systems acquisition process and gaining control of systems acquisition costs.

Process Improvement

Packard established a Defense Systems Acquisition Review Council (DSARC) within OSD to advise him of the status and readiness of each major defense system to proceed from one project phase to the next phase in its life cycle.[15] The DSARC functions were to be separate

from, not part of, the management reviews assigned to the Director of Defense Research and Engineering (DDR&E). The DSARC reviews were made to permit coordinated evaluations and deliberations among senior managers prior to a decision to proceed to the next phase in the acquisition project.

In addition to the DSARC actions, Packard requested that the DDR&E conduct a management review at least once on each major acquisition project. Such reviews would prove helpful in determining what OSD actions might be taken to improve management of the defense systems acquisition process.

About the same time, Packard took a number of other important steps. He requested that increased dependence be placed on hardware competition — using prototypes — and demonstration, and that decreased dependence be placed on paper competition. Critics of this process claimed it added substantially to development time and, as a consequence, to cost. Advocates said costs should be examined over the entire life cycle of a defense system and the system benefits from the early discovery of problems or defects. Prototyping appears to be most advantageous when the defense system: (1) entails substantial innovation, (2) is to be produced in quantity, and (3) is characterized by a low ration of development to total acquisition costs.

Relative to test and evaluation (T&E), he requested that it begin as early as possible and be conducted throughout the acquisition process to assess and reduce risks and to estimate the operational effectiveness and suitability of the system being developed. Before the start of testing, issues critical to the system mission, test objectives, and evaluation criteria were to be determined. Successful accomplishment of the T&E objectives were to be the criteria for approving the commitment of significant additional resources to a program, or for advancing a program to the next phase in its life cycle.

In May 1970, Packard issued a memorandum citing other ways by which the acquisition of major defense systems could be improved.[16] The essential features of this memorandum served as the basis for DOD Directive 5000.1, "Acquisition of Major Defense Systems," the first of a number of directives and associated instructions in the "5000 series." The memorandum and directive stated Packard's ideas that "successful development, production, and deployment of major defense systems are primarily dependent upon competent people, rational priorities, and clearly defined responsibilities." Decentralization — which still did not exist — of responsibility and authority for the acquisition of major defense systems was to be fostered to the greatest extent possible, consistent with the urgency and importance of a particular program. Project managers were to be given adequate authority to make major decisions, rewards for good work, and more recognition toward career advancement. The OSD was to assume responsibility for establishing acquisition policy and ensure the major programs were being pursued in response to specific needs. The military departments were to be given responsibility for identifying needs and defining, developing and producing systems to satisfy these needs. The OSD and the military departments were to be given joint responsibility for monitoring the progress of each major project. The DSARC, established previously, was formally recognized as the group that would support SECDEF decision-making at each project milestone.

Under Packard, OSD disengaged from the detailed direction of the defense systems acquisition process and assumed the role of monitor and decision-maker at milestones associated with major systems only. The monitoring process required that a "contract" be established between OSD and the procuring military department. The contract was the development concept paper (DCP), administered by the DDR&E. The DCP described the technical requirements to be achieved; the thresholds which, if exceeded, would be the basis for a review of the entire project; the quantity; the cost; and the schedule. At each decision point, the project was reviewed by the DSARC. If the DSARC determined that the project was ready to advance to the next phase, the recommendation was made to the SECDEF, who had the decision authority. The SECDEF decisions at Milestones I, II and III were reflected in the DCP and incorporated in the FYDP documentation at the next project objectives memorandum (POM) submission.

The DCP became known as a decision coordinating paper in 1971. Through the years, it changed. Limited to 10 pages, it provided program information essential to the decision-making process. It contained a statement of the direction needed from the SECDEF, a description of the overall project, the need for the project, the design alternatives, the project schedule and acquisition strategy, and the issues affecting the SECDEF's milestone decision. The DCP annexes included project goals and thresholds, resources required, and projected life-cycle costs.

Before the close of the 1970s, the SECDEF decision memorandum (SDDM), rather than the DCP, began to serve as the "contract" between OSD and the procuring service. The SDDM recorded the SECDEF decisions and directions following receipt of DSARC recommendations; breaches of project thresholds; PPBS changes that affected project execution; and congressional actions that affected project execution.

The integrated program summary (IPS) – a document developed in the late 1970s – includes, like the SDDM, some of the information formerly presented as part of the DCP. This 60-page (or less) document summarized the acquisition plan to allow informed analysis by interested OSD staff members. The mandatory annexes included a cost track summary, a funding profile, a summary of system acquisition costs, manpower requirements and logistics data.

Defense Systems Acquisition Education

To provide professional education in project management and defense systems acquisition management, Packard established the Defense Systems Management School (now College) on 1 July 1971. This institution was given three missions as follows:

– Prepare selected military officers and civilian personnel for assignments in project management career fields

– Conduct research and special studies in project management and defense systems acquisition management

– Assemble and disseminate information relative to project management and defense systems acquisition management.

Concurrency vs. Nonconcurrency

The concept of concurrency, which evolved in the late 1950s on the Air [illegible]e Ballistic Missile Program, involved the initiation of some of the production activities on a project prior to completion of the full-scale development effort. During the 1960s, the concurrency approach was used on the major systems acquisition projects, commensurate with the risk.

In 1969, Packard conducted a review of many defense systems acquisition projects and discovered that the projects in trouble at that time were using the concurrency concept. A detailed study of the concurrency concept use on successful projects was not made. As a result of Packard's discovery, in a blue ribbon defense panel report in 1970 and a RAND report completed in the spring of 1971, Packard cautioned against unnecessary overlapping of project phases (concurrency) on future systems acquisition projects.

In the late 1970s, a Defense Science Board (DSB) study concluded that cancellation of some of the projects in the late 1960s could not be attributed to the application of the concurrency concept. In many cases, the projects had been cancelled for political or technical reasons, or because of a change in threat. Further, the DSB found that (1) an early production commitment did not necessarily cause a project schedule to slip, even though a development problem had to be corrected, (2) the addition of more formalized test and evaluation procedures during the 1970s was ensuring earlier discovery and correction of development projects, and (3) concurrency had been a normal practice in commercial business for many years. Therefore, the DSB took the position that overlap of project phases was desirable, provided that a competent project manager was available to make it work, and the risks involved were not too large.

Cost Growth

During the late 1960s and early 1970s, the Congress was becoming increasingly concerned about (1) the cost growth on major design projects and (2) the tendency of DOD to become "locked into" development and production of major systems regardless of any increase in cost.

Packard recognized the need for an independent cost analysis group at the OSD level in 1969; however, such a group was not formally established until January 1972 when the SECDEF issued a memorandum establishing an OSD Cost Analysis Improvement Group (CAIG).[17] The group was given a charter to provide the DSARC with an independent evaluation of the cost of each major defense system project and to establish uniform criteria, standards and procedures for use by all DOD units making cost estimates.

In DOD Directive 5000.4, which provided a permanent charter, the CAIG became "an advisory body to the DSARC on matters related to project cost," and the focal point for cost analysis activities involving OSD staffs and all DOD components. Other duties of the CAIG included: (1) providing policy for the collection, storage and exchange of information on improved cost estimating procedures, estimating methods and historical cost data, and (2) revising existing or developing new techniques for projecting costs.[18]

Total Package Procurement Discontinued

Use of the total package procurement concept was discontinued by Packard. He believed contracts should be tailored to the risks involved. Cost-plus-incentive-fee contracts were preferred for advanced and full-scale development of major defense systems. When technical risks permitted, such contracts were to include provisions for competitive fixed-price subcontracts for subsystems, components and materials. This enabled major portions of the projects to benefit from competition. When risks were reduced to where realistic pricing could take place, fixed-price contracts were to be used. Packard requested consideration be given to the use of negotiated fixed-price contracts after the production design could be specified realistically. To the extent possible, contracts negotiated under these circumstances were to encourage competition for subsystems, components, and materials.

The Decade of the Seventies

Since the issuance of the basic DOD Directive 5000.1, focusing on the acquisition of major systems, several DOD policy issuances elaborating upon, or augmenting, the original policy was forthcoming in the 1970s. This chapter cannot cover each of the policy documents in detail. However, many of them are worthy of mention before reviewing the principal events surrounding those this chapter addresses. The principal policy documents not discussed are identified below:

—*Defense Acquisition Regulation* (formerly the Armed Services Procurement Regulation)

—*Administration-General.* DODD 5000.23, "Systems Acquisition Management Careers," November 1974; DODD 5000.29, "Management of Computer Resources in Major Defense Systems," April 1976; DODD 5160.55, Defense Systems Management College, January 1977

—*Technical Management.* DODD 4120.3, "Defense Standardization and Specification Program," February 1979; DODD 4120.21, "Specifications and Standards Application," April 1977; DODD 4151.1, "Use of Contractor and Government Resources for Maintenance of Material," June 1970; DODD 4151.9, "Technical Manual Management," January 1975; DODD 5010.19, "Configuration Management (supporting DODI 5010.21 was cancelled)," May 1979; DODI 5000.36, "System Safety Engineering and Management," November 1978; DODI 5000.37, "Acquisition and Distribution of Commercial Products, September 1978

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—*Resource Management.* DODI 7000.2. "Performance Measurement for Selected Acquisitions," June 1977; DODI 7000.3, "Selected Acquisition Reports," April 1979

—*Contract Management.* DODD 5010.8, "DOD Value Engineering Program," May 1976

—*Information/Data Management.* DODD 5000.19, "Policies for the Management and Control of Information Requirements," March 1979; DODI 5000.32, "DOD Acquisition Management Systems and Data Requirements Control Program," March 1977

—*International Cooperation.* DODD 2000.9, "International Coproduction Projects and Agreements Between the U.S. and Other Countries or International Organizations," January 1974; DODD 5530.3, "International Agreements," December 1979.

Commission On Government Procurement Report

In December 1972, the Commission on Government Procurement, chaired by E. Perkins McGuire, a consultant and corporation director, and cochaired by Representative Chet Holifield from California, presented its report to Congress.[19] The commission — the first ever to concentrate exclusively on procurement — made 149 recommendations. Eighty-two recommendations required executive branch action and 67 required legislative action.

Among the principal findings of the commission were the following:

—Government procurement policies and procedures were needlessly diverse.

—The Congress was ill-equipped to evaluate performance, costs, and schedules for new defense systems projects in the context of national security objectives and priorities.

—Contractors were frequently bewildered by a variety of requirements from different government agencies, but lacked an effective route in the executive branch through with to appeal for more realistic treatment.

—There was no systematic government-wide effort for studying ways to improve the procurement process.

Relative to the systems acquisition process, the commission found "the kind of data used to choose a preferred system (from available alternatives), the timing of the choice, and the subsequent design latitude have a predictable effect on the outcome of a major system project." The commission also found a need to realign "...the acquisition structure to correct the *de facto* abdication of responsibilities in government and industry that has come about for want of a clear understanding of the decisions and actions that actually control system acquisition projects."

The commission findings led to a major recommendation that an Office of Federal Procurement Policy be organized in the executive branch to formulate government-wide acquisition policies and regulations, and to monitor government-agency acquisition practices. Such an office was formed. The commission also recommended the acquisition work force be upgraded by establishing an institution that could provide necessary education and services. This was accomplished by the formation of the Federal Acquisition Institute (FAI) under Public Law 93-400.

Among the commission recommendations directly applicable to the major systems acquisition process were the following:

— Emphasize competition on alternative systems approaches at the "front-end" of the acquisition process in order to minimize the occurrence of performance and cost problems downstream.

— Increase competition for major system acquisition contract awards by encouraging small- and medium-size companies to propose alternate design concepts, provided they have contingency plans for the purchase or lease of production facilities in the event they win the competitions.

— Simplify the decision-making process, but keep it flexible, and place greater reliance on sound judgment and less on regulations and complicated contracts and clauses.

— Develop legal and administrative remedies to speed resolution of contract disputes.

- Reduce management and administrative layering between policy-makers and program offices.

— Require more government reliance on the private sector, rather than in-house facilities, for procurement.

— Study means to increase awareness of the costs associated with the implementation of social and economic goals through procurement.

— Give visibility to the Congress to exercise its responsibilities; i.e., provide congressmen with the information needed to make key program decisions and commitments.

The general industry reaction to the report was favorable. One industry spokesman said increased competition was the most innovative portion of the commission's four-volume report. Other industry spokesmen felt that implementation of the recommendations would result in greater competition for new projects because of the early competition and the entrance of small companies into the market. The spokesmen felt that implementation of the recommendations would result in less red tape for government contractors, who were being confronted with a maze of procurement regulations.

Pentagon officials took the attitude that DOD was already moving in the direction recommended in the commission's report. The actions initiated by Packard two years earlier, and now being refined by new Deputy Secretary of Defense William P. Clements, Jr., were consistent with the commission's recommendations. However, DOD did initiate a change to the defense systems acquisition process. The change required that a greater search be made for alternative concepts at the "front-end" of the process. It was believed that by placing greater emphasis on the front end, the costs in the out phases would be reduced. However, the question that must be answered on each project is, "How many competing concepts can be funded without having front-end costs get out of line?"

Controversy arose in government circles over the proposal to limit in-house government procurement and in industry circles over the use of government purchasing programs to further social and economic goals.

The report of the commission, while it attracted very little public attention, placed a sharp focus on the procurement process and brought about some needed reforms. Some of the commission's recommendations were implemented quickly; others took longer to implement; and some may never be acted upon either by the Congress or the departments within the executive branch.

New Program Milestone

When the new milestone was added to the front end of the defense systems acquisition process, it was identified as Milestone O. This avoided renumbering the original milestones, and possibly creating unneeded confusion. According to the new procedure, the milestone decisions and phases of activity were as follows:

—*Milestone O Decision.* Approval of mission element need statement (MENS) and authorization to proceed into the concept exploration phase (Phase 0). The MENS identifies the mission, threat (basis for the mission), existing capabilities to accomplish mission, assessment of need, constraints, resources, and schedule to reach Milestone I.

—*Milestone I Decision.* Selection of most promising alternative concepts and authorization to proceed into the demonstration and validation phase (Phase I).

—*Milestone II Decision.* Selection of the preferred alternative concept(s) and authorization to proceed into the full-scale development phase (Phase II), which includes limited production for operational test and evaluation. The SECDEF approval also indicates his intention to deploy the system.

—*Milestone III Decision.* Authorization to proceed into the full production and deployment phase (Phase III).

On a major defense system project, only the SECDEF had the prerogative to permit the

omission of one or more of the project milestones or phases and to authorize "go-ahead" on the next one. Information for the SECDEF and the Congress dealing with quarterly post-Milestone III status and threshold breaches on major defense systems is reported in the selected acquisition report (SAR) as was practiced previously.

Life-Cycle Cost And Design-To-Cost

In the early 1970s, life-cycle cost (LCC) and design-to-cost (DTC) played important roles in the DOD strategy to improve the defense systems acquisition process – a process that had to succeed if the United States was to continue to have a credible defense at an affordable cost.

In 1973, DOD adapted the design-to-cost concept to the systems acquisition process. This concept, used by companies in the commercial business field for many years, involved the establishment of a specific cost figure (in constant dollars for a specified number of systems at a defined rate of production) early in the system life cycle – before entry into the full-scale engineering development phase of a program.

In the initial issue of DOD Directive 5000.1, it was stated that "discrete cost elements (e.g., unit production costs, operating and support costs) shall be translated into 'design to' requirements. System development shall be continuously evaluated against these requirements with the same rigor as that applied to technical requirements. Practical trade-offs shall be made between system capability, cost, and schedule. Traceability of estimates and costing factors, including those for economic escalation, shall be maintained." The design-to-cost concept recognized that the best system design is a function of need, performance, life-cycle cost and the number of defense systems required to meet the threat. It does not compromise system performance (capability) to meet cost objectives.

The Aerospace Industries Association (AIA) concluded in 1973 that the design-to-cost concept would not have an impact on defense business unless some positive action were taken by DOD to ensure its effective implementation. Shortly thereafter, AIA began working with the OSD staff to develop a sound design-to-cost policy, and with the Joint Logistics Commanders to develop effective implementing procedures. The directive published in 1975 – DOD Directive 5000.28 – was favorably received by industry. To comply with this directive, the military departments had to revise their joint guide to make it more compatible with the policy contained in the directive. This revision was accomplished and industry found most of the practices set forth in the revised guide to be acceptable.

In the ensuing years, application of the design-to-cost concept proved helpful on many programs by reversing the trend toward high unit production costs.

The DOD discovered that the design-to-cost principles are critical to controlling LCC. The initial design-to-cost goal should be decided in the conceptual period of a program, because cost is a feasibility issue. When there is a problem of buying sufficient defense systems to counter a potential enemy threat, high-cost solutions are not affordable.

Up to 3 percent of the LCC can be consumed in demonstration and validation, 12 percent in full-scale development, 35 percent in production, and up to 50 percent in operation and support. Therefore, the dollars spent prior to production to lower either production costs or operation and support costs can result in a significant return on investment. Cost distribution on a specific defense system program may vary considerably from these percentages. The cost of the demonstration and validation phase usually tends to be significantly understated because contractors may finance up to 50 percent of the effort.

A review of the applications of life-cycle costing – initiated in November 1974 and completed in April 1976 – was conducted by a National Security Industrial Association (NSIA) *ad hoc* committee at the request of the ASD (Installations and Logistics). This review on the subject of LCC established a dialogue between DOD and defense industry and a better understanding of life-cycle costs.[20]

Joint-Service Projects

Joint-Service acquisition projects have been strongly supported and generally encouraged by OSD and the Congress for some time. In 1973, the Joint Logistics Commanders issued a memorandum of agreement (MOA) setting forth principles of joint project management.[21] The MOA introduced the concept of an executive (or lead) Service and participating Services and established the general authority and responsibilities of the Services on a joint project. The MOA also addressed multi-Service project charters, project master plans, and joint operating procedures to be used in joint project management. To implement the concept, the MOA was promulgated as a joint regulation. A joint project is generally structured to ensure accomplishment of specific goals. The importance of the project, as well as its size and urgency, affects the organizational structure and the way the project business is conducted.

Most of the policy and procedural guidance during the 1970s was developed by the cooperative effort of the Services; however, the Service-wide procedure for joint project contracting was documented in the Defense System Acquisition Regulatory System (DSARS).

In the late 1970s, the JLC sponsored the development of a guide to assist the people involved in joint-Service project management. The guide was published by the Defense Systems Management College in March 1980.[22]

Industry Concerns and DOD Actions

In the mid-1970s, industry voiced a concern that not all of the system acquisition policies issued by OSD were being carried out as intended. The industrial associations sounded the alarm. The National Security Industrial Association (NSIA), in a letter to Clements in April 1975, identified industry concerns and offered suggestions for improving the credibility of the DOD procurement process "...in the eyes of the public and Congress, and strengthen mutual trust and respect between DOD and industry in the contractual relationship."[23] An attachment to the letter addressed such problems as excessive requirements, underestimating, overoptimism, unrealism

of costs and schedules, buying-in, best and final offers (an auctioning technique), cost growth, overcontrol of industry and change orders. The proposed remedies included ways to reduce acquisition costs, develop more realistic cost estimates, enhance the integrity of the procurement process, and improve the DOD-industry relationship.

After thoughtful consideration of industry recommendations, revisions were made to DOD directives and instructions, as well as to appropriate Service regulations. In some cases, problems were eliminated when the intent of the directives already issued was clarified. One of the actions taken by Clements in August 1975 was to require the military managers of 59 designated programs to report program status to him directly on a monthly basis.[24] This action by Clements stirred up the military departments and helped bring about some constructive actions within the overall acquisition process. When Charles W. Duncan, Jr., succeeded Clements in 1977, this reporting procedure was discontinued on the basis that it had served its purpose. It is important to note that although DOD made a sincere effort to resolve the problems highlighted by industry, many of the problems persisted.

Acquisition Advisory Group Report

In April 1975, Clements established an Acquisition Advisory Group (AAG) composed of persons at the executive level representing a wide spectrum of professional backgrounds and experience, both military and civilian, in various functional areas bearing on defense systems acquisition.

The AAG was given a charter to examine and assess the recommendations contained in recent reports of the Army Material Acquisition Review Committee (AMARC), the Navy/Marine Corps Acquisition Review Committee (NMARC), and the recommendations of the Secretary the Air Force regarding the management of defense systems acquisition at the OSD level. The September 1975 AAG report submitted by Alexander H. Flax, its chairman, stated that "...acquisition management problems in OSD arise from well-motivated but inappropriate and largely ineffectual attempts to compensate at that level for failings in the military departments and program (project) offices in the detailed execution of weapon systems acquisition programs."[25]

Recommendations made by the AAG were thoroughly studied within OSD and the Services. As a result, a series of positive actions were taken. For example, responsibility for projects that had passed Milestone III (commitment to production) was delegated to the Service Secretaries for surveillance; DSARC reviews of projects meeting objectives were held only in connection with major decision milestones; several projects were transitioned to Service control. Joint-Service, strategic, or internationally-oriented projects, as well as those of major importance, continued under OSD direct decision control.

Profit Policy

In May 1975, the Deputy SECDEF initiated a study to revise the DOD profit policy. This study, known as "Profit '76," was conducted for the purpose of finding a way to correct some

of the deficiencies found in earlier profit policies and to motivate defense contractors to make investments that would lower DOD systems acquisition costs. The study, which reviewed a five-year period, disclosed that major defense contractors realized an average pretax profit of 4.7 percent on sales of defense hardware and a 17.1 percent profit on their sales of commercial products. Further, the contractor's level of investment in facilities used for defense work was 10.9 percent of annual sales dollars, as compared with 41.1 percent for facilities used for commercial work. Clements concluded that many defense contractors believed defense business was not sufficiently profitable for the risks involved.

At the completion of its study, the "Profit '76" team arrived at the following policy, which has been in effect on DOD projects initiated since completion of the study:

— Recognize capital (facilities) as a real and essential ingredient of contract performance.

— Uniformly compensate contractors for the time value of facilities capital employed at an imputed interest rate associated with a risk-free investment. Treat this imputed interest as an allowable contract cost.

— Recognize that a special risk attaches to capital investments made for defense work. Provide contractors the opportunity to earn profit to compensate for this risk.

— Emphasize effort and risk as profit determinants rather than contract costs.

— Recognize productivity as a factor in establishing the profit objective for a contract.

The new profit policy focused on a contractor's effort assumption of risk, and degree of facility investment. The DOD anticipated the policy would instill in defense industry some motivation for overall cost efficiency. There appeared to be no significant improvements in profit margins as a result of implementation of the policy. Consequently, industry acceptance of the profit policy was lukewarm.

The A-109 policy was patterned after DOD directives in the 5000 series, particularly 5000.1. Consequently, it was consistent with the recommendations made by the Commission on Government Procurement in 1972.

As a result of the issuance of the A-109 policy, the SECDEF took the following action:

— Appointed the Under Secretary of Defense for Research and Engineering the Defense Acquisition Executive (DAE). The DAE was to be the principal advisor and staff assistant to the SECDEF for the acquisition of defense systems and equipment.

— Called for revision of DOD Directive 5000.1 and DOD Instruction 5000.2 to place additional attention on the front end of a program; i.e., the establishment of the need for a program and reconciling that need to DOD capabilities, priorities and resources.[26]

Industry, in an appearance before the House Armed Services Subcommittee on Research and Development in April 1978, indicated its support for improvements to the systems acquisition process – in this case, the issuance of A-109. The subcommittee was told that implementation of the policy would "...improve the understanding by all participants of mission needs and goals; increase reliance on the private sector, enhance the competitive spirit...better focus responsibilities and authority, and increase and improve communications with the Congress."[27]

The Four-Step Source Selection Process

In 1976, DOD issued a revision to DOD Directive 4105-62.[28] This revision established a four-step process for the procurement of advanced development, engineering development, and operational systems development effort. The reason for the new process was to put an end to the charges that DOD was engaging in unfair competition and using unsound business practices in evaluating the proposals and capabilities of companies competing for a contract.

The four steps in the source selection process are summarized below:

– Step 1. Submission and evaluation of technical proposals

– Step 2. Submission and evaluation of cost/price proposals and, if appropriate, revised technical proposals

– Step 3. Establishment of a common cutoff date for receipt of final revisions to the technical and cost/price proposals

– Step 4. Negotiation of a definitive contract with the selected offeror.

The four-step process forced more government-industry dialogue prior to solicitation. Also, technical leveling, technical transfusion and auctioning were reduced and buy-ins declined.

Zero-Base Budgeting

One of President Jimmy Carter's first actions after taking office in 1977 was to direct the agencies within the executive branch to implement a zero-base budgeting (ZBB) process for preparation of the fiscal year 1979 and future budgets.[29] The ZBB was a management process that provided for the systematic consideration of all projects and activities in conjunction with project planning and the formulation of budget requests. The principal goals of ZBB were to examine the need for existing projects to allow proposed new projects to compete with existing projects on an equal footing for resources; to focus budget justifications on evaluations of projects and to secure extensive managerial involvement at all levels in the budget process.

Planning, Programming and Budgeting System Refined

In October 1977 the new SECDEF, Dr. Harold Brown, directed that the PPBS be revised to achieve the following objectives:

- Permit the SECDEF and the President, based on the advice of all appropriate offices and organizations in DOD, to play an active role in shaping the defense project

- Create a stronger link between planning the programmatic guidance and fiscal guidance

- Develop, through discussion, a sound and comprehensive rationale for the defense project

- Ensure that the defense project is based on sound analysis and contributions from all relevant offices.

The DRB was chartered to ensure major defense systems projects were closely aligned to the PPBS. In addition, the DRB was charged with the following:

- Directing and supervising OSD review of Service POMs and budget submissions

- Examining and resolving major Service issues without SECDEF involvement, if possible

- Presenting recommendations to the SECDEF for action when deemed desirable.

On March 27, 1981, the chairman of the DRB, Mr. Carlucci, directed the role and membership of the DRB be expanded. Figure 7 displays the expanded membership of the DRB and points out the relationship of its membership to the DSARC membership. The principal changes to the membership were the addition of the Chairman of the Joint Chiefs of Staff, the Service Secretaries, and the Associate Director from the Office of Management and Budget.

According to Mr. Carlucci, the primary role of the expanded DRB was to help the SECDEF manage the entire revised planning, programming and budgeting system. He planned to hold regular monthly DRB meetings to (1) review proposed planning guidance; (2) manage the program and budget review process; (3) advise the SECDEF on policy, planning, program and budget issues, and proposed decisions; (4) perform program evaluations and reviews of high-priority programs on a regular basis; and (5) ensure major acquisition systems are more closely aligned to the PPBS. The DRB chairman said he expected DRB members to be more than advocates of their particular areas of responsibility; they must take a broader and deeper DOD view and help the SECDEF and DEPSECDEF manage DOD better.

Brown believed the revised system would provide a more coherent basis for guiding the military departments in preparing their specific program objectives memoranda (POM). The

revised system provided consolidated guidance to the military departments and defense agencies. The consolidated guidance identified fiscal guidance at three fiscal levels – minimum, basic, enhanced – in accordance with ZBB requirements.

A major problem in the defense systems acquisition process still to be solved was how to connect effectively the SECDEF decisions following DSARC meetings to the PPBS.

Defense Resources Board

In April 1979, an advisory board, to be known as the Defense Resources Board (DRB), was established by Brown.[30] This board, chaired by the Deputy SECDEF, was given a charter to accomplish the following:

– Improve PPBS efficiency and effectiveness

– Direct and supervise OSD review of the Service project objectives memoranda and budget submissions

– Examine and resolve major Service issues without SECDEF involvement, if possible

– Present recommendations to the SECDEF for action when deemed desirable.

The International Environment in the 1970s

Duri the 1970s, the steady buildup of the Soviet R&D procurement outlays gave the United States and Western Europe no alternative but to pursue wiser utilization of their combined resources. Failure to do so could have placed the Unites States and its allies in the position of not being able to preserve credible deterrence and defense in the 1980s.

Western Europe, unhappy with U.S. domination of the defense systems and equipment market throughout the 1950s and 1960s, began to call for a "two-way street"; i.e., reciprocal purchases of defense systems and equipment. The defense industries of our allies were growing. Therefore, unless the United States took the lead in establishing cooperative armaments projects, the trend would probably continue. If it did, it would reduce U.S. exports in Western Europe and prevent interoperability of defense systems or equipment within NATO countries.

This situation provided the background for President Carter's initiatives at the NATO Ministerial Meeting held in England in May 1977. At the meeting, President Carter stated the position of the United States relative to meeting the military and political challenges of the 1980s through the alliance. He said:

> We must make a major effort to eliminate waste and duplication between national programs: to provide each of our countries an opportunity to develop, produce, and sell competitive defense equipment; and to maintain technological excellence

in all allied combat forces. To reach these goals our countries will need to do three things. First, the United States must be willing to promote a genuinely two-way trans-Atlantic trade in defense equipment...Second...the European allies (must) continue to increase cooperation among themselves in defense production...Third...European and the North American neighbors of the Alliance (must) join in exploring ways to improve cooperation and procurement of defense equipment....

The Period of Transition: Late 1970s to Early 1980s

At the beginning to the 1980s, our adversary, the Soviet Union, was much stronger than it was at the start of the 1970s. The United States had been losing ground for many years in force modernization. However, Dr. Perry, in a statement to the Congress in February 1980, said that the United States was turning the corner and "...if we sustain the momentum of the new five-year defense program, the decade of the 1980s will show us, along with our allies, narrowing the gap in the quantity of equipment deployed, while maintaining a qualitative edge." He added that, "...in this era of unprecedented change, technological strength is the key to our long-range survival as a nation. A strengthened and vigorous program in defense research, development and acquisition is fundamental to the maintenance of stability and peace in the years ahead."

The United States was behind the Soviet Union quantitatively in deployed weapon systems and has been falling farther behind because of disparities in production rates for new systems. Although the United States had maintained a lead in defense technology, it could have lost that lead in the 1980s because the Soviets had greatly increased their investment in defense research and development. Dr. Perry believes the United States still has some distinctive advantages at this time, namely: "a superior technological base, a competitive industry with greater productivity, and allies with a substantial industrial capability."

Office Of The Secretary of Defense Viewpoint

It was Dr. Perry's viewpoint that our defense investment policy during the 1980s must include two important objectives:

- Modernization of U.S.-deployed defense systems
- Maintenance of leadership in technology critical to defense.

He believed the size and complexity of the research, development and acquisition effort in the next decade would be a challenge to management. However, if the defense systems acquisition process could be improved further and managed effectively, it might be possible to reduce acquisition costs and delays in deploying new or modified defense systems.

In 1979, the Office of the Under Secretary of Defense for Research and Engineering

undertook a series of management initiatives. The objectives – continuing into the 1980s – were to:

– Increase competition in procurement

– Use technology to achieve major cost reductions in manufacturing

– Extend the useful life of existing defense systems through product improvement

– Improve cooperation with U.S. allies in armaments development and production

– Accelerate the acquisition process by permitting tailoring when the benefits appeared to outweigh the cost of increased risk and extraordinary attention by management. Successful implementation of the initiatives would place the United States in a better defensive posture at the end of the decade.

Dr. James P. Wade, Jr., Assistant Secretary of Defense (Atomic Energy), at a DSMC presentation in April 1980, suggested some options for coping with the potential shortfall in deployed defense systems before the end of the eighties. The options he saw were as follows:

– Allow the defense systems in the current inventory to age

– Redesign the defense systems to achieve lower unit costs

– Reduce force levels to equalize operating and modernization needs

– Extend the effective operational life of all defense systems by preplanned product improvement.

Dr. Wade, as well as the Joint Logistic Commanders, suggested that more attention be focused on the fourth option.

A report of a Defense Science Board (DSB) task force chaired by Dr. Richard D. Delauer, a corporation executive, summed up the problems at the turn of the decade:

> The progression of acquisition policy changes from Total Package Procurement through the DSARC process, fly-before-buy (to reduce risks), full-scale prototyping, increased emphasis on operational test and evaluation...has evolved out of the perceived need to correct deficiencies observed in specific projects by introducing additional management review and decision checkpoints to assure past mistakes would not be repeated. These procedural changes have become institutionalized and have been applied inflexibly to all projects with the result that

the acquisition process has steadily lengthened and the procurement of defense systems has become increasingly costly.

Lack of realism in the estimation of project costs, changes in specified performance requirements, inflation, and other such causes of cost growth have caused the aggregate cost to planned production projects to substantially exceed the allocated budgetary resources.

[This has resulted in a] ...need to delay the completion of the production phases of projects in order to fit the total available defense budget each year.

The DSB recommended that DOD directives focusing on major defense systems acquisition be updated to:

— Stress the need to consider the affordability of acquiring the defense system at every milestone

— Introduce the concept of flexibility and timeliness throughout the defense systems acquisition process

— Encourage combining milestones, whenever possible

— Discourage system prototyping, unless the prototype is producible

— Encourage joint development and operational testing, and independent evaluation

— Require program decisions be correlated with the PPBS

— Establish that the Milestone III decision represents approval of rate production

— Emphasize that upgrading of existing defense systems is a desirable alternative to new defense systems development whenever feasible.

The DSB recommendations were incorporated into the latest revision of DOD Directive 5000.1 and DOD Instruction 5000.2. The revision to the test and evaluation directive (5000.3) and the integrated logistic support directive (5000.39) — replacing DOD Directive 4100.35 — incorporated new or revised policies based on lessons learned in the 1970s. Among other top-level documents prepared or revised at that time were those covering reliability and maintainability, specification tailoring, manufacturing technology, embedded computer software, value engineering, and contractor incentives. A move toward greater use of commercial products, services and practices was initiated.

Defense Industry Viewpoint

Many staunch industry supporters of the maturing defense acquisition process became concerned about the deteriorating health of the defense industry. They attributed at least some

of this to the factors listed below, as put forward by Oliver C. Boileau. Jr., a corporation president:

— Innovation was being discouraged

— The United States was not producing enough defense systems

— Too many "review boards" were capable of scrapping a program. Their decisions may have been based on political, rather than military, considerations

— Reporting requirements are too numerous

— Industry profits are too low. As a result, many defense contractors are seeking nondefense business

— The government has shifted its role from that of partner to dominant partner to what, in many respects, might be considered an adversary.

The DOD and industry management agreed that acquisition of new defense systems was taking too long. The 12 or more years usually required to bring new systems into the inventory was intolerable; therefore, a way had to be found to reduce the time. Part of the problem, Boileau pointed out, was that a typical major defense system being procured for the inventory had to run an "obstacle course" from the day it was conceived until the day the last unit was delivered to the customer. Sometimes the technology in the defense system became obsolete before all of the units were delivered. Also, the need for the system — based upon capability to meet a threat — often changed while the system was in production. If the need for the system ceased to exist, production must be canceled. When such a cancellation occurred with little or no warning, it could have thrown involved contractors into extreme financial difficulty.

If DOD didn't find a way to cope with the conditions cited above, defense contractors might not be willing to invest substantial funds of their own in new defense system concepts. There was a strong industry resistance to investing in the facilities and equipment necessary to economical production because of the continually shrinking production requirements.

Congressional Viewpoint

Before presenting the congressional viewpoint, some "state setting" might be in order. The Congress usually accepted technological parity with the U.S. adversary as a criterion for supporting the acquisition of defense systems and equipment. Congressional committees consistently placed pressure on DOD officials to:

— Carefully assess the threat, and determine U.S. needs

— Improve the planning and budgeting process

— Complete programs in a timely and cost-effective manner

– Control cost growth

– Cancel nonproductive projects

Generally, the Congress disapproved follow-on effort on marginal programs.

Through the years, there was constant striving to improve the resource allocation process. In DOD, an annual review of mission areas proved to be a beneficial way of placing defense systems acquisition projects in a broader perspective. Accordingly, the Commission on Government Procurement recommended the congressional budget proceedings begin with an annual review by the appropriate committees of the missions, capabilities, deficiencies and the needs and goals for new acquisition projects. This could form a basis for budget reviews. This concept was adopted in the Congressional Budget and Impoundment Control Act of 1974. In accordance with the Act, the FY 1979 President's defense budget contained the first mission-oriented display of DOD projects. Most budgets contain such displays; however, the Congress has shown little enthusiasm for examining Service projects from this perspective.

Every year the Congress reviews the current defense posture and policies, determines the priorities for defense spending, and authorizes funding. To do so requires considerable study, patience and time. To accomplish this task effectively, the congressmen find it advisable to call upon military and civilian experts in DOD to serve as witnesses and provide advice. In addition, congressmen have to call on their staff members for support.

When the time comes to cast a vote, the decisions of the congressmen are based on their appraisal of, and confidence in, advice of industry executives and representatives of the industrial association, expert witnesses, arguments posed by military lobbyists, and findings and recommendations of their staff members.

International Program Arena

The number of defense systems acquisition projects in the international arena continued to grow. As it did, more U.S. project managers were affected by the many managerial problems that had to be solved. Before any project manager could function effectively in this arena, the proponents of international projects had to take additional steps to resolve their differences and reach a common understanding on benefits to be gained by international projects.

Managers of defense systems projects had a limited, but extremely significant, role to play in the international arena. The DOD officials viewed the acquisition of defense systems as the activity that followed the making of essential policy-level decisions between the allied nations. The project managers who had to perform in this arena needed a first-hand knowledge of the policy and a clear understanding of the procedures and techniques that would lead to successful internationalization of defense systems acquisition programs.

The Decade of the Eighties

Deputy Secretary of Defense Frank C. Carlucci, perceiving a need for economy and efficiency in defense systems acquisition, took action in the spring of 1981 by chartering five working groups composed of representatives from the Office of the Secretary of Defense (OSD) and the Services. These working groups reviewed the current acquisition process and, by means of a combined report, recommended changes to the process. This report, which included inputs from industry, was submitted to the Deputy Secretary of Defense (DEPSECDEF) on March 31, 1981.

After reviewing the report and discussing its contents with the Secretary of Defense (SECDEF), the Joint Chiefs of Staff, the Service Secretaries, and others, Mr. Carlucci wrote, "...the Secretary and I have decided to make major changes both in acquisition policy and the acquisition process itself." Accordingly, on April 30, 1981, Mr. Carlucci initiated a series of 31 innovative actions. On July 27, 1981, he added another action – Competition. Taken together, these innovative actions became known as the Department of Defense (DOD) Acquisition Improvement Program.

The innovative actions included the following:

– Reaffirmation of the major acquisition management principles

– A method for making preplanned product improvements

– A method for multiyear procurement to ensure the acquisition of property and services in the most economical manner, consistent with sound judgment. The economics and efficiencies of multiyear contracts would be balanced against risks from unstable operational, technical, design or quarterly requirements.

The criteria presented as guidelines for decision-makers included:

- Benefit to the government
- Stability of requirements
- Stability of funding
- Stability of configura n
- Degree of cost confidence
- Degree of confidence in contractor capability

– A method for ensuring program stability

—A method to encourage capital investment to enhance productivity. Associated with this action was to be a plan to:

- Permit more rapid capital depreciation
- Structure contracts to permit companies to share in cost reduction resulting from productivity investments
- Increase the use and frequency of milestone billings and advanced billing
- Provide for negotiation of profit levels commensurate with risk and contractor investment
- Grant equitable economic price adjustment (EPA) clauses in all appropriate procurements
- Increase emphasis on manufacturing technology programs
- Provide a consistent policy to promote innovation by giving contractors all the economic and commercial incentives of the patent system and protection of proprietary rights and data
- Work to repeal the Vinson-Trammel Act, which imposed profit limitations

—A method for budgeting to most-likely or expected costs, including predictable cost increases due to risk, instead of the contractually-agreed-upon cost

—Policy requiring the Services to fund programs at economic production rates

—A plan to ensure that appropriate contract types are used on defense systems programs

—These initiatives support improved readiness. They require that resources to achieve readiness receive the same emphasis as those required to achieve schedule or performance objectives

—A plan to reduce administrative cost and time to procure items

—A plan to evaluate, quantify and budget for technological risk on a program

—A plan to provide adequate front-end funding for test hardware

—The requirement to establish a joint OSD and Service team to weigh the impact of various governmental requirements and regulations on the efficiency and effectiveness of the total DOD acquisition and contraction process

—The requirement to establish a joint OSD, Service and industry team to provide recommendations to substantially reduce the number of directives and documentation required in contracts

—The requirement to establish procedures to provide funding flexibility within a given fiscal year from procurement to research, development, test and evaluation when the SECDEF determines it is in the national interest to do so

—The requirement to establish guidelines to incentivize contractors to improve reliability and support

—A plan to reduce the number of briefings and data required for a DSARC review

—A plan to budget effectively for inflation on major acquisition programs

—A plan to forecast effectively the business conditions at major defense plants

—A plan to improve the source selection process

— The requirement to develop and use standard operational and support systems

—The requirement to (a) provide appropriate incentives to industry by associating fee awards with the actual costs achieved during the early production runs on a program, and (b) make Design to Cost (DTC) awards and offer incentives based on evidence during early production runs that DTC goals are being achieved

—Assignment of overall responsibility to the Under Secretary of Defense for Research and Engineering for implementation of the DOD Acquisition Improvement Program

—The requirement to revise DOD Directive 5000.1 and DOD Instruction 5000.2 to reflect the decision milestones selected for defense systems programs

—The requirements to revise DOD Directive 5000.1 and DOD Instruction 5000.2 to require submission of a Mission Element Need Statement (MENS) no later than the Service POM, thereby linking the acquisition and the PPBS processes

—The requirement to include the appropriate Service Secretary or Service Chief as a full member of the DSARC

—The requirement to retain the Under Secretary of Defense for Research and Engineering (USDRE) as the Defense Acquisition Executive (DAE)

—The requirement to establish the criterion for the defense systems to be reviewed by the DSARC

—The requirement to establish the criterion for integrating the DSARC/PPBS decision

—The requirement to give the program manager a voice in the support resource allocation and budget execution process through increased and centralized resource visibility and

coordination by the program manager on changes to his plans. This initiative was a cornerstone in the implementation of the management principles on improving readiness and delegating authority

—The requirement to include improvement of reliability and support in the action taken to satisfy Initiative 9

—The requirement to increase competition in the acquisition process. This initiative, added on July 27, 1981, was favorably received by the military services and the defense agencies.

Based on the objectives, the Office of the Under Secretary of Defense issued a memorandum on November 10, 1981, which tasked the military services and the defense agencies to:

—Designate advocates for competition at each procuring activity

—Establish goals for increasing competition

—Ensure commanders understand their responsibilities with regard to competition

—Make competition a matter of special interest

—Develop procedures to identify and elevate significant achievements.

The following discussion describes the changes to the Defense Resources Board (DRB), the DSARC, and the basic acquisition process resulting from implementation of the DOD Acquisition Improvement Program.

Defense Resources Board

Consider the changes to the DRB, an advisory board formed in April 1979 and chaired by the DEPSECDEF.

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PART ONE

PROLOGUE: ESTABLISHMENT OF THE UNITED STATES DEPARTMENT OF DEFENSE

"Self-examination, if it is thought enough, is nearly always the first step toward change."

—Thomas Mann
Author, Winner of the Nobel Prize
in Literature, 1929

Chapter 1

The Beginning

In 1789, the Department of War was established as an executive department of the government by an act of the Congress. This department was headed by the Secretary of War and his powers were handed down by the President. He was given responsibility for conducting Navy and Army affairs. This organization existed until 1798 when the Department of the Navy and the Office of Secretary of the Navy were established. At that time, the Marine Corps was also established in the Department of the Navy. The first Marine organization, the Continental Marines, under a Board of Naval Affairs, was established by a resolution of the Continental Congress in 1775. From 1798 until passage of the National Security Act of 1947 by the Congress, military affairs were managed through two executive departments, the Department of War and the Department of the Navy.

After World War II, the organization and management of defense became subjects of controversy. Two revolutions contributed to this controversy. First, the technological revolution resulted in the development of complex and costly defense systems of great destructive power. The international tension in the world provided the basis for continuing the technological revolution and the opening of new technology frontiers. Second, there was a revolution in strategy. Before World War II, the United States followed a policy of strategic mobilization. That policy evolved into one of deterrence. Among the specific considerations that brought about the change in strategy were massive retaliation and controlled response supported by the nuclear and conventional forces-in-being.

With the passage of time, problems relating to strategy became more complex, the need for resolution became more demanding, and solutions more difficult. Differences arose concerning the approach to and emphasis on these problems. Criticism centered primarily on organization and management. The main argument was that innovations had not kept pace with technological advancement and changes in strategy. It was with this background that the need for change in organization and management came about.

The change began in 1947, when there was a lack of unanimity within the two military departments on what action should be taken. At that time, Secretary of War Henry L. Stimson favored a single, unified military department. Secretary of the Navy James F. Forrestal, on the other hand, opposed unification and proposed a new management layer over the two existing military departments. Authority of the new level of management was limited to coordination. Then, in 1947, the Congress passed the National Security Act. This primarily followed the views of Secretary Forrestal.

Chapter 2

The National Military Establishment

The National Military Establishment was created by passage of the National Security Act on September 18, 1947. At that time, the Army, Navy and Air Force were made cabinet-level executive departments, and the Secretary of Defense (SECDEF) was authorized to function primarily as a coordinator. In 1949, through amendments to the National Security Act, the SECDEF became the principal assistant to the President of the United States on defense matters. The National Military Establishment was renamed the Department of Defense (DOD). Further, through the amendments, the military departments became subordinate to the DOD and were required to provide uniform budgetary and fiscal procedures.

Chapter 3

Provisions of the National Security Act of 1947

In its "Declaration of Policy," the Congress made clear its intent "...to provide three military departments for the operations and administration of the Army, the Navy (including naval aviation and the United States Marine Corps), and the Air Force, with their assigned combat and service components; to provide for their authoritative coordination and unified direction under civilian control but not to merge them; to provide for the effective strategic direction of the armed forces and for their operation under unified control and for their integration into an efficient team of land, naval, and air forces."

To carry out this intent, the Act established a unique organization — a federated agency called the National Military Establishment, with a SECDEF at its head, to coordinate three separate executive departments. In this federation, the general direction would be under the SECDEF, but the internal administration of the Services would be left to the departments. They would be linked together, however, by various coordinating and joint agencies. The organizational structure is shown in Figure 8.

The SECDEF was defined by the Act as "the principal assistant to the President in all matters relating to the national security." In this capacity, he would establish "general policies and programs" for the military departments and agencies, and exercise "general direction, authority, and control" over them. He would take "appropriate steps to eliminate unnecessary duplication or overlapping in the fields of procurement, supply, transportation, storage, health, and research." In addition, he would "supervise and coordinate the preparation of the budget estimates of the departments and agencies comprising the National Military Establishment; formulate and determine the budget estimates for submittal to the Bureau of the Budget (BOB); and supervise the budget programs of such departments and agencies under the applicable appropriation Act."

While his office was to be kept to a minimum, the SECDEF could draw on several joint agencies for help in achieving coordination of activities involving the three Services.

— A *War Council* was constituted to advise the SECDEF who held the power of decision on "matters of broad policy relating to the Armed Forces."

— The *Joint Chiefs of Staff (JCS)* were to be "the principal military advisors" to the President and the SECDEF. The Staff was to:

- Prepare joint logistic plans and to assign to the military services logistic responsibilities in accordance with such plans
- Formulate policies for joint training of the military forces

• Formulate policies for coordinating the education of members of the military forces

• Review major material and personnel requirements of the plans.

—Another coordinating agency established by the act directed by a civilian chairman was the *Munitions Board.* It included an Under Secretary or Assistant Secretary from each of the three departments. Acting under the direction of the SECDEF, and in support of JCS strategic and logistic plans, the Munitions Board was to:

• Coordinate the appropriate activities within the National Military Establishment with regard to industrial matters including the procurement, production and distribution plans of the departments and agencies comprising the Establishment

• Plan for the military aspects of industrial mobilization

• Recommend assignment of procurement responsibilities among the several military services and plan for standardization of specifications and the greatest practicable allocation of purchase authority of technical equipment and common-use items on the basis of single procurement

• Prepare estimates of potential production, procurement and personnel for use in evaluating the logistic feasibility of strategic operations

• Determine relative priorities of the various segments of the military procurement programs

• Supervise such subordinate agencies created to consider the subjects falling within the scope of the Board's responsibilities

• Make recommendations to regroup, combine or dissolve existing inter-Service agencies operating in the fields of procurement, production and distribution in order to promote efficiency and economy

• Maintain liaison with other departments and agencies correlating military requirements with the civilian economy, particularly regarding procurement or disposition of strategic and critical material. Maintain adequate reserves of such material, and make recommendations on policies in connection therewith; presented by the JCS and those presented by the production, procurement and distribution agencies assigned to meet military needs, and to make recommendations thereon to the SECDEF

• Perform such other duties as the SECDEF may direct.

The SECDEF was assigned another agency of common action – the Research and Development Board. Composed of a civilian chairman and two representatives from each of the departments, the Board was "to advise the SECDEF as to the status of scientific research relative to the national security, and to assist him in assuring adequate provision for research and development on scientific problems relating to the national security." More specifically, it would be the responsibility of the Board, under the direction of the SECDEF to:

– Prepare a complete and integrated program of research and development for military purposes

– Advise with regard to trends in scientific research relating to national security and the measures necessary to ensure continued and increasing progress

– Recommend measures for coordinating research and development among the military departments and for allocating among them responsibilities for specific programs of joint interest

– Formulate policy for the National Military Establishment in connection with research and development matters involving agencies outside the National Military Establishment

– Consider the interaction of research, development and strategy, and advise the JCS in connection therewith

– Perform such other duties as the SECDEF may direct.

Chapter 4

Forrestal Implementation of the Act of 1947

James V. Forrestal, the first Secretary of Defense, found that he had to be more than just a coordinator of a loosely knit federation of coequal, operating Service entities. As time passed, he found he needed an independent staff and increased authority over the military departments. In his first annual report, presented toward the close of 1948, he recommended a broad clarification of his powers, provision of an Under Secretary, designation of a chairman for the JCS and enlargement of its Joint Staff, and the removal of the Service Secretaries from membership on the National Security Council (NSC).

Chapter 5

Hoover Commission and Eberstadt Task Force

The views expressed by Forrestal in 1948 were reinforced by the first Commission on organization of the executive branch of the government. Under the chairmanship of former President Herbert Hoover, assisted by "task forces," this Commission conducted an extensive examination into the organization and operation of the various segments of the government. One of the task forces – that led by Ferdinand Eberstadt – was concerned with the National Security Organization.

The Eberstadt task force considered the new system "a long step forward," but one that neither worked well nor yielded "maximum security for the defense dollar." In part, this was attributed to the newness of the organization. It was also due, however, to a "lack of clear firm policy from above" and a failure to understand the organization and use it to its full potential. Furthermore, the task force observed, "the continuance of intense inter-service rivalries hampers and confuses sound policy at many points." Among other things, the Eberstadt group called for a greater centralization of authority in the SECDEF, a major overhaul of the military budget system, and improved teamwork throughout the National Security Organization.

In its report to the Congress, the Hoover Commission recognized the need for a strong military establishment. The Commission expressed concern about the impact of military spending on the economy and the need for making certain that the military arm "will not grow up as a thing apart." Among the serious organizational defects noted by the Hoover Commission was that the authority of the SECDEF, and hence the control of the President, was "weak and heavily qualified by the provisions of the Act of 1947 which set up a rigid structure of federation rather than unification."

To improve organization, the Commission recommended that "full authority and accountability be centered in the SECDEF, subject only to the President and the Congress." The Secretary should have full control over military budgets and expenditures. All statutory authority, then held by the Service departments, should be vested in the SECDEF; and he should have the power to delegate such authority "as he sees fit and wise." The Service Secretaries, redesignated as "Under Secretaries for Army, Navy, and Air Force," should be made "directly and exclusively responsible" to the SECDEF, and should be denied the right of appeal over his head. The JCS should have a chairman to preside over them and to represent them to the Secretary. The latter should also be provided with a full-time Deputy, three Assistant Secretaries, and the personnel needed to relieve him of detail, and to advise and assist him in program planning and execution.

Chapter 6

The Reorganization Acts

1949 Act

Many changes proposed by Forrestal and the Hoover Commission were adopted in the National Security Act Amendments of 1949. On August 10, 1949, these amendments converted the National Military Establishment into an "Executive Department" and was renamed the "Department of Defense." The Army, Navy and Air Force lost their "executive" branch status and were redesignated as "military departments" within the new DOD. The SECDEF was given unqualified direction, authority and control over the DOD. The three Service secretaries were removed from the National Security Council (NSC) and lost their earlier right of appeal to the President or the Director of the BOB. The chairmen of the Munitions Board and the Research and Development Board were given the power of decision. The JCS was given a nonvoting chairman, senior in rank to all other military officers, to preside over its meetings, expedite business, and bring to the attention of the SECDEF or the President matters upon which the Joint Chiefs had a divided opinion. The Joint Staff was increased from 100 to 210 officers. The Secretary was given a Deputy and three Assistant Secretaries to help him discharge his responsibilities.

The establishment of firm budget controls in the Office of the SECDEF for the military establishment as a whole was of special significance. The amendments provided for a comptroller for the DOD and prescribed a performance budget "so as to account for, and report the cost of performance of readily identifiable functional programs." Comptrollerships and uniform budgetary and accounting procedures were prescribed for the three departments. Thus, a legislative foundation was laid for bringing order out of the existing confusion in military budgeting and fiscal procedures.

By strengthening the position of the SECDEF, the 1949 amendments marked a significant step away from the principle of federation toward that of firm unification. At the same time, the Congress retained some of the earlier restrictive features and added others. It again announced its intent was not to merge the military departments but to provide for their coordination and unified direction under the control of the SECDEF. The departments were to be "separately administered" by their respective Secretaries. The "combatant" functions assigned to the military services were not to be "transferred, reassigned, abolished, or consolidated"; and military personnel were not to be so detailed or assigned as to "impair such combatant functions." The SECDEF was expressly forbidden to direct the use and expenditure of DOD funds in such manner as to circumvent these prohibitions. Departmental Secretaries and members of the JCS were not barred from presenting to the Congress, after first informing the SECDEF, any recommendations relating to the DOD that they deemed proper.

The 1949 amendments did not remove inter-Service conflicts. Problems became apparent not so much in the organizational structure but in the continued disagreement on strategy and composition of forces best suited to support our policy of national security.

1953 Act

Eisenhower's "New Look". As the Harry S. Truman administration drew to a close, it appeared the defense organization would soon undergo further change. During his campaign, Dwight D. Eisenhower was critical of the defense structure. Among other things, he called for clear-cut lines of authority, a greater degree of Service unification, and a larger measure of civilian control. As he prepared for the changeover to the Republican administration, Truman invited comments on the defense organization from his principal advisers. Robert A. Lovett, who replaced George C. Marshall as SECDEF in September 1951, voiced strong criticism. General Omar N. Bradley, Chairman of the JCS, and Vannevar Bush, former Chairman of the Research and Development Board, likewise found fault. All of their comments contained one thing in common: strengthen the planning role of the JCS and improve its relationship to the SECDEF in policy-making.

Having committed his administration to "security with solvency," Eisenhower sought a reduction of defense costs. President Eisenhower's "New Look" or "floating D-Day" approach marked the reassertion of budgetary considerations as the controlling element in defense planning. The tightness of the budget situation made it more imperative that such planning be closely attuned to established national objectives.

The Rockefeller Committee. Early in the Eisenhower administration, a committee was constituted, under the chairmanship of Nelson A. Rockefeller, to review the basic organization and procedures of the DOD. The Committee focused on the position of the SECDEF and his principal civilian and military officials. The Committee believed its organizational proposals would establish a framework within which the DOD could operate more effectively to attain the broad objectives toward which then SECDEF Charles E. Wilson and Eisenhower were working, namely to provide the United States with maximum security at minimum cost and without danger to our nation's free institutions.

The Rockefeller Committee's recommendations became the basis for Reorganization Plan No. 6 of 1953. In presenting this plan to the Congress on April 3, 1953, the President set forth three basic objectives: (a) a "clear and unchallenged responsibility in the Defense Establishment"; (b) "maximum effectiveness at minimum cost"; and (c) the "best possible military plans." Achievement of the first objective was sought by clarifying the lines of authority within the DOD so there would be no question of the direction, authority and control of the SECDEF over all the agencies and components of his department. The doctrine of civilian control was to be firmly established with a single line of authority from the President, as Commander in Chief, down to the SECDEF. No function in any part of the DOD was to be performed independently of the SECDEF. The latter would, however, act through the three Service Secretaries who were viewed

as his "operating managers," and his "principal advisors" on the entire range of problems within the DOD.

To meet the first objective, the JCSs were excluded from the chain of command.

To meet the second objective of the 1953 Reorganization Plan — "maximum effectiveness at minimum cost" — the Munitions Board, the Research and Development Board and the Defense Supply Management Agency were abolished. The Rockefeller Committee considered them "too unwieldy and rigid" for their tasks and recommended the transfer of their functions to the SECDEF for distribution among an augmented staff of Assistant Secretaries. Reorganization Plan No. 6, in support of this recommendation, authorized the appointment of six additional Assistant Secretaries and a General Counsel of comparable rank. The Assistant Secretaries would serve in a "staff" capacity, assisting in the development of policies, prescribing standards and bringing to the SECDEF information on which he might base his decisions. As such, they were not to be in the direct line of administrative authority over the three departments. Their linkage to the chain of command, however, placed them in a strategic position with the SECDEF. The latter came to lean heavily on their advice, often against Service positions.

To meet the third objective — the "best possible military plans" — the JCS operation was strengthened. The Rockefeller Committee stressed the need for enabling the JCS to work more effectively as a unified planning agency, unrestricted by Service positions or instructions and providing the SECDEF with advice based on "the broadest conception of the national interest." Removal of this corporate body from the channel of command to the theaters emphasized its basic planning and advisory role.

1958 Act

The Debate. The 1953 reforms strengthened the role of the SECDEF, but the reforms did not prevent the recurrence of old problems and old complaints. The issues revolved around strategic concepts, weapon systems and Service unification. The administration believed the United States could deter attack if it maintained the capability for massive retaliation together with an effective continental defense system. If an attack came, the United States would blunt it and reciprocate by destroying the enemy's ability to continue the war. Meanwhile, research and development would be pursued actively to ensure superiority of the United States in modern and effective defense systems. To minimize the use of manpower, reserve forces would augment regular forces in an emergency. The American economy would be kept viable and ready for quick conversion to full mobilization if necessary.

Defense expenditures in support of this program were maintained at levels far in excess of anything experienced before in peacetime. Budgetary considerations had an important influence on the implementation of various aspects of this program as well. Whether our military establishment had the proper "mix" of defense systems and manpower to deal effectively with either local emergencies or general war remained a matter of continuous debate. Neither the JCS

nor anyone else could be certain as to the priority needs of our country's security. Force-level decisions and budget allocations continued to be based on inter-Service compromises.

In the spring of 1955 a task force of the second Hoover Commission reiterated the old complaint that the NSC was not providing a clear, integrated national policy. The JCS were charged with being a trading post instead of an objective group in which the national interest was paramount.

Increasingly, critics charged that the pro-Service attitudes of the individual members of the Joint Chiefs made it difficult for them to provide the SECDEF with impartial advice. The existing system of three departments headed by a fourth was deemed cumbersome and expensive. The imposition of a phalanx of civilians at the policy level in the military departments and the DOD posed problems of "acclimatization" and of coordination. The existing division of the armed forces did not appear to be attuned to the vastly increased capabilities of modern defense systems.

Proposals for further reorganization were advanced. Some advocated a military staff for the SECDEF, separated from their respective Services and, therefore, in a position to render objective advice. Others suggested replacing the JCS with a committee of senior officers who would retire or head unified commands after their duty with the office of the SECDEF. Some proposed the divorcement of the JCS members from their command responsibilities within their respective Services so they could devote their full energies to strategic planning and advice. Again, the plea was made for an armed services general staff with a single chief of staff from whom authoritative military advice might be obtained. Others advocated a sweeping reorganization of the armed services along functional lines, grouping forces according to tasks we were likely to face in a future war (strategic, tactical, continental defense, antisubmarine and the like) in place of the conventional Army, Navy, Air Force and Marine designations.

"Adjustments" by the Secretary of Defense. Secretary of Defense Wilson was not disposed toward reorganizations requiring further changes in the unification laws. He opposed establishing a common supply and Service agency for fear the undertaking would be too vast a task and might prove detrimental to the national defense. To achieve greater efficiency and economies, Wilson introduced single managership over common supply and Service operations; and he instituted an inter-Service supply support program for areas not covered by the single manager plan.

Several important organizational changes were effected at the DOD level. On March 17, 1957, Wilson ordered the merger of the offices of the Assistant Secretaries of Research and Development and Applications Engineering under an Assistant Secretary for Research and Engineering.

In November 1957, Wilson's successor, Neil H. McElroy, established a director of Guided Missiles, reporting directly to him with the responsibility for overall coordination of the entire missile program.

The President's Views

Eisenhower's Presentation to the Congress. In his State of the Union message on January 9, 1958, President Eisenhower announced SECDEF McElroy's decision to concentrate in one organization all the antimissile and satellite technology undertaken within the DOD. The Advance Research Projects Agency (ARPA), as it was to be called, would manage such projects during the research and early development stages; and as soon as feasible, it would turn the projects over to the Services that would deploy the defense systems.

President Eisenhower also indicated a move to reorganize the DOD structure further would be forthcoming. His message was devoted to two overriding tasks: "insuring our safety through strength;" and "constructive work to build a genuine peace." Relative to the first, Eisenhower reiterated his conviction that we had a "broadly based and efficient defensive strength including a great deterrent power."

In spite of his optimism, Eisenhower considered a number of actions "not merely desirable" but "imperative." The first was "to assure ourselves that military organization facilitates rather than hinders the functioning of the military establishment in maintaining the security of the nation." Repeated congressional and executive actions since World War II fell short of achieving "maximum organizational efficiency in modern defense establishment." He said, "Some of the important new weapons which technology has produced do not fit into any existing Service pattern. They cut across all Services, involve all Services, and transcend all Services, at every stage from development to operation. In some instances they defy classification according to branch of Service."

Pending the outcome of a special study of the problem, Eisenhower set down in terms of objectives the main lines a reorganization should take. First, there was need for "real unity...in all the principal features of military activity," especially in strategic planning and direction. Full coordination was needed in the development, production and use of the U.S. "defensive resources," particularly with respect to the newer defense system. There was need for "a clear subordination of the military services to duly constituted civilian authority" — a control that "must be real, not merely on the surface." He said we must make certain, as well, that excessive organizational fragmentation does not create "costly and confusing compartments in our scientific and industrial effort." Finally, he indicated that clear organization, decisive central direction, and unstinted cooperation of everyone in the defense establishment would be required "to end inter-service disputes."

Rockefeller's Report. In the spring of 1958, a distinguished panel, headed by Nelson A. Rockefeller and at work since the fall of 1956, produced a report on the military aspect of our international security. This had a bearing on the proposals. In its consideration of "Defense Organization," the Rockefeller Panel pointed to three critical weaknesses:

1. The roles and missions assigned to the individual military services have become competitive rather than complementary because they are out of accord with both weapons technology and the principal military threats to our national safety;

2. The present organization and responsibilities of the JCS preclude the development of a comprehensive and coherent strategic doctrine for the United States;

3. The SECDEF is so burdened with the negative tasks of trying to arbitrate and control inter-Service disputes that he cannot play his full part in the initiation and development of high military policy.

As noted by the panel, these difficulties "are inherent in the present organization of the Defense Department"; and they could not be removed "merely by adjustments of the existing structure." The panel recommended basic changes in the roles and missions, the JCS operations, and the authority of the Secretary of Defense. The panel believed implementation of these recommendations would provide "a unity and coherence now absent from our defense organization." They will be "the primary means to achieve economies in our defense structure because they will permit a better utilization of resources."

With respect to roles and missions, the Rockefeller Panel recommended removing the military departments from the channel of operational command. The departments would cease to be responsible for carrying out particular combat missions, and would be confined to rendering support with recruitment, training, research, procurement and supply for unified operational commands. Thus, relieved of their responsibilities for strategic planning and combat operations, the Service Chiefs and their civilian superiors would be able to concentrate on management and logistics tasks.

All of our military operational forces would be organized into unified commands to perform missions called for by our strategic requirements.

As for the JCS, the Rockefeller Panel recommended that the chairman, who alone could give "full-time attention to problems of overall strategic doctrine," would be the "Principal Military Advisor to the Secretary of Defense and the President," instead of the Joint Chiefs, collectively. The Service Chiefs would continue to serve on the JCS, "but only as advisors to the Chairman and with particular responsibility for the areas of logistics, training, and procurement."

The Rockefeller Panel also proposed strengthening the authority of the SECDEF. To ensure swift reaction in wartime, the line of operational command would be from the President and the SECDEF as "deputy commander-in-chief" to the functional commanders through the JCS Chairman in his capacity as Principal Military Advisor. The line of "logistic command" would run from the President through the SECDEF to the three Service Secretaries. The SECDEF would have authority over all research, development and procurement. He would be empowered to cancel and transfer Service programs and their appropriations. He would be given a direct appropriation for conducting research and development programs at the DOD level.

In place of "a series of compromises," there would be "a clear sense of direction" in defense systems development; and the United States would be in a better position to keep up and stay ahead in the technological race.

Eisenhower's Proposal. On April 3, 1958, President Eisenhower presented his proposal for a DOD reorganization to the Congress. In requesting revision of the unification laws, he made clear his belief that future wars would be fought in all elements, with all Services operating under unified command in a single, concentrated effort. He deemed it essential, therefore, that the peacetime structure and activities of the DOD conform to this concept. The President's specific reform proposals addressed five major categories: (a) unified commands, (b) operational command channels, (c) the JCS, (d) defense administration, and (e) research and development.

In the latter category, Eisenhower sought to strengthen the control and supervision by the SECDEF over the crucial fields of research and development. He believed centralized management of research and development would avoid duplication and prevent gaps in this program. The President proposed that the position of Assistant Secretary of Defense for Research and Engineering be upgraded to Director and the entire effort be placed under his authority. It would be the responsibility of the Director of Defense Research and Engineering to meet the national military objectives instead of the more limited requirements of each Service. Programs showing no promise or unnecessarily duplicative would be terminated, and promising programs would be released for development or production.

The President's proposal encompassed actions he could undertake, as well as actions requiring legislative sanction. The latter were submitted to the Congress in the form of a draft reorganization bill.

About mid-April 1958, Eisenhower ordered immediate action on eight points of his reorganization plan. The steps taken by executive order were to:

- Unify all combat operational forces under the direction of the SECDEF and the JCS
- Delegate administrative, training and logistics functions to the Secretaries of the Army, Navy and Air Force by removing them from the chain of command and control of combat or operational units
- Assign the JCS to the SECDEF with no authority to issue orders to the Commands except in the name of the SECDEF
- Discontinue the Joint Staff committee system and strengthen the Joint Staff by adding an integrated operations division
- Require preparation of budget estimates for fiscal 1960 and, thereafter, be in a form that would permit the Congress to appropriate funds to the DOD instead of the individual Services

– Review numbers and activities of personnel in the military departments engaged in legislative liaison and public affairs and transfer the functions to a centralized agency in the DOD

– Recommend the nomination of an Assistant Secretary of Defense for legislative liaison

– Require that recommendations for promotions, assignments, reassignments or removals of top-ranking admirals and generals, after advice from Service Secretaries and JCS, be submitted to the President for approval. Establishing procedures to transfer officers between Services were to be with the consent of the individual in each case.

Prior to submittal of President Eisenhower's reorganization bill, there was a considerable variation of opinion regarding the defense organization. Although agreeing that some sort of change in the defense structure was required, there was little, if any, concurrence on what kind of change should be put into effect.

Initial action was taken in the House of Representatives through the introduction of a bill by Rep. Carl Vinson, D-Ga., Chairman of the House Armed Services Committee; Rep. Leslie Arends, R-Ill.; and Rep. Paul Kilday, D-Texas. The sponsors' aim was to provide a bill that would improve national security "by changes that will provide a defense system that exposes rather than obscures facts, that reveals rather than conceals problems, and facilitates rather than impedes decisions."

Debate in the House and Senate Armed Services Committees continued throughout the spring and summer of 1958 without a clear-cut resolution of the points of disagreement. However, the Committee hearings provided a forum for the statement of Service positions prior to passage of the measure.

The Congress was, in some respects, rather critical; and attempts were made to slow the trend toward centralization in the defense establishment. The integrity of the military departments, the powers to be given to the SECDEF, and the character of the latter's military staff were matters of extensive debate.

When enacted, the DOD Reorganization Act of 1958 accepted most of the President's recommendations, but modifications were made in areas invading congressional prerogatives and disturbing the traditional alignment of the Services.

The following Service positions were expressed as quotes extracted from testimony before the House and Senate Armed Services Committees during the spring and summer of 1958.

Army

General Omar Bradley: I am in general agreement with the changes recommended by our President and with the purposes of such changes.

General Maxwell Taylor, Chief of Staff of the Army: ...I would like to say a few words about the military aspects of the proposed legislation. In my judgment, the key to the problem of reorganizing the DoD is the matter of unity of effort. Unified direction of strategic planning and unity of military command are essential to the effective use of our military forces...Having carefully examined the proposed legislation, I have concluded that it will, in fact, provide for the unity in strategic planning and in military command which I consider essential to our national security...The military advantages of the legislation appear to me very great. The streamlining of the channels of military responsibility will facilitate reaction in dealing with future aggression so as to defeat it quickly and to prevent it from expanding into total nuclear war...I support the House version of the reorganization bill, with the modifications recommended by the DoD...

Navy

Admiral Arleigh H. Burke, Chief of Naval Operations: I am in accord with clarifying the authority and responsibility of the SECDEF as necessary. If he is to run the DoD efficiently he must have appropriate authority to do it...I support the objectives of having the authority and responsibility of the commanders of unified and specified commands clarified so as to insure they have full operational authority over their forces...I am in accord with elimination of the present "executive agency" chain of operational command established by the President's message and the substitution of direct command from the President to the SECDEF through the JCS to the unified and specified commanders...Further, I am in favor of establishing a Director of Defense, Research and Engineering, in the DoD not only to eliminate duplication and to stop unproductive development before millions have been spent on it, but, more importantly, to insure that no gaps are left in our research programs and that promising research is pushed to completion quickly and economically...A sound organizational structure for our defense system is necessary. But the most important element in any human endeavor is the people whose intelligence, knowledge, experience, and dedication make the organization work...I believe that this bill is an instrument by which our defense organization may be adjusted to the changing security needs of the Nation.

Marine Corps

General Randolph Pate, Commandant of the Marine Corps: I applaud and support the general objectives (of the President's plan) with only a few reservations...I do not consider organization and reorganization to be panaceas...No amount of organizational tinkering can take the place of good men, wholeheartedly determined to make a system work...The proposed provisions for efficient centralization of defense research and engineering under the immediate control of the SECDEF seem to me to be wise and forward-looking...One proposal which I support completely is that which would facilitate transfer of officers among the Services...I can and do support wholeheartedly the objectives sought by the

President and by Congress in the various proposals that have been advanced for reorganization of the DoD...There is no organization which cannot be improved – and I do not exclude the Marine Corps. To be better prepared to meet emergencies; to improve our military planning; and to improve our overall efficiency and unity in the Defense Establishment are all goals to which I give my unqualified support and unremitting efforts.

Air Force

General Thomas D. White, Chief of Staff of the Air Force: I favor the defense reorganization proposal because, in my opinion, its implementation will accomplish four primary objectives which, I feel, are vital in this day and age. These objectives are:

– Establish a peacetime organization which can meet wartime requirements.

– Provide a system which will better enable the Joint Chiefs of Staff to act with corporate responsibilities and corporate views.

– Assign clear-cut authority and responsibility to the SECDEF.

– *Provide a better defense at comparable cost....*

In my opinion, a reorganization of the DoD which provides better management and more effective utilization of our national resources and military structure is essential to the security of our country...Technological advances, particularly in new defense systems, demand that our peacetime organization be instantly responsive to the wartime requirement. Time and distance are no longer on our side as far as organization and mobilization for war are concerned...I completely agree with the President's concept that separate ground, sea, and air warfare are gone forever, and that peacetime preparation and organization must conform to this fact. It is essential that our combat forces be organized into truly unified commands and that our strategic and tactical planning be completely unified. Thus, I support the reorganization bill as proposed by the President.

Provisions of the 1958 Act

The 1958 Act, although it fell short of the Administration's initial plan, provided the DOD with the most thorough streamlining since its creation in 1947. It increased the effectiveness of the unified and specified commands and established a chain of operational command from the President to the SECDEF to the unified and specified combat commanders. The "executive agency" system, whereby the departmental secretaries were in the operational chain of command, was discontinued. Also, the Act brought significant changes in the JCS operation. See Figure 9.

The 1958 Act authorized changes in defense administration that would strengthen the authority of the SECDEF and eliminate inter-Service disputes and delays. Transfer, reassignment, abolition and consolidation of combatant functions were permitted, but only after due notice to the House and Senate Armed Services Committees and in the absence of resolutions rejecting such action. The President could take such action in case of "hostilities or imminent threat of hostilities," and it would remain in effect at his will until the end of the threat or the hostilities. The SECDEF could "assign, or reassign, to one or more departments or services, the development and operational use of new weapons or weapons systems." In the interest of "effectiveness, economy, or efficiency," moreover, he could create "a single agency" or other appropriate agency to carry out "any supply or service activity common to more than one military department."

The 1958 Act sought to clarify OSD-departmental relationships. The departments were to be "separately organized" under their own Secretaries, but the latter would be responsible to the SECDEF for the operation and efficiency of their respective departments. Assistant Secretaries of Defense could give orders to a military department when authorized to do so in a particular area, but such orders had to be given through the Service Secretary or his designee. Service Secretaries, their civilian assistants and the military personnel were expected to "cooperate fully" with OSD personnel "in a continuous effort to achieve efficient administration of the DoD and effectively to carry out the direction, authority, and control of the SECDEF."

The legislative branch shared the view of the President that the authority of the SECDEF for Research and Development required clarification and strengthening. In place of the Assistant Secretary of Defense for Research and Engineering, the 1958 Act created the new post of Director of Defense Research and Engineering. Taking precedence immediately following the SECDEFs, the Deputy Secretary of Defense, and the Service Secretaries, this official would be the principal advisor to the SECDEF on scientific and technical matters.

Many significant benefits flowed from the 1958 reorganization of the defense establishment. The operational forces were organized effectively into unified commands for the attainment of national objectives. Military command channels were streamlined. The JCS became a larger professional staff for unified strategic planning, and was in a better position to assist the SECDEF in his direction of the unified commands. With the clarification and strengthening of his authority, the SECDEF was better able to function as agent of the President, who was Commander in Chief. His broadened powers over Service roles and missions and over military research and development enabled the SECDEF to increase the overall efficiency of the DOD and to curtail the earlier tendency toward Service rivalry and controversy.

Effects of the 1958 Act

By the close of the Eisenhower administration, the sweeping reorganization prescribed by the 1958 Act had been in effect for two years; and it was clear the reorganization had made a substantial imprint on DOD operations.

Within the framework of the Act, a number of administrative measures were taken to achieve further improvements. Shortly after he took office in December 1959, Secretary of Defense Thomas S. Gates, Jr., sought to keep himself informed promptly of any divergences within the JCS; therefore, he sat with the Joint Chiefs to consider disputed issues and either settle the matters or present them to the President for decision.

A number of other important administrative changes were introduced. The staff of the Office of Director of Guided Missiles and the Advanced Research Projects Agency (ARPA) were brought under the Director of Defense Research and Engineering, thus making the latter the chief architect of the military space program. In April 1960, the supervision and coordination of the test ranges, tracking stations, and other facilities used in the missile and space programs were also centralized under his direction. Establishment of a Defense Communications Agency was approved in May 1960. The purpose of the Agency was to centralize operational control and supervision of all long-haul communications requirements of the DOD.

Improvements were also effected in the presentation and disposition of defense budgets. The military section of the President's 1960 budget took on a new form. Instead of groupings by departments, defense expenditures were presented in terms of major resource categories — military personnel; operation and maintenance; procurement; research, development, test and evaluation; military construction; and revolving and management funds.

Dr. Herbert York, first Director of Defense Research and Engineering, was given surveillance over the entire research and development programs of the three Services and ARPA. A Weapons System Evaluation Group was also assigned to his office.

1960 Proposals by Symington

In early 1960, Sen. Stuart Symington, D-Mo., proposed that (a) the Service Secretaries be replaced by Under Secretaries of Defense, who would handle administrative functions; and (b) the President establish unified commands for defense, strategic, combatant, logistic and other purposes. (See Figures 10 and 11.) Sen. Symington also proposed that the SECDEF be given the power to transfer Service personnel from one Service to another. In addition, he proposed that a Chief of Staff of Defense be named to head the JCS with the power of final decision over all matters coming before the JCS. These proposals were not acted upon by the Senate Armed Services Committee.

In August 1960, Democratic presidential nominee, Sen. John F. Kennedy, chose Sen. Symington to head a committee to study the defense organization and offer a specific plan for changes to it in order to make it more effective. Sen. Symington cautioned that his earlier reorganization proposals would not necessarily become the final plan proposed by his committee.

In December 1960, the Symington Committee proposed some sweeping changes in the organization of the DOD. The proposed changes were in line with what the Air Force generals were beginning to favor. However, the Navy was violently opposed to the changes, and the Army

reaction was not clear. Major opposition to the proposal came from many military quarters, as well as from conservative members of the House and Senate.

A few days later, President-elect Kennedy named Robert S. McNamara, Secretary of Defense. At the outset, Secretary McNamara indicated he was not committed to the findings of the Symington Committee and any decision to pursue the plan would await the results of a study he and those serving as top officials in his department would conduct. Although the Symington plan was not accepted, some budgetary procedures he proposed were adopted.

1986 Act

By passage of the Goldwater-Nicholas DOD Reorganization Act of 1986, the chain of command ran from the SECDEF to the unified and specified commanders in chief. Orders and other communications were transmitted through the chairman of the JCS.

Today, 14 defense agencies and three military departments report to the DOD. The four armed services are subordinate to their military departments. The Marine Corps is the second armed service in the Department of the Navy. A fifth armed service, the U.S. Coast Guard, reports to the Department of Transportation in peacetime and to the Department of the Navy in wartime. The military departments are responsible for recruiting, training and equipping their forces; but, operational control of those forces in combat is assigned to one of the 10 unified and specified commands.

Chapter 7

The Political Character of Defense Policy-Making

The political character of defense policy-making was recognized from the beginning. Although the military experts contribute to policy formulation, the responsibility for decisions rests with politically accountable civilian authorities; i.e., the SECDEF and the President of the United States. The SECDEF, of course, must work responsibly, efficiently and effectively to meet the objectives of the President, his superior.

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PART TWO

INCEPTION OF AN ORGANIZED MANAGEMENT APPROACH

"Nothing is more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things."

– Niceolo Machiavelli
Italian Writer and Diplomat
(1469 – 1527)

Chapter 8

A Historical Perspective

The basic objective of defense spending is preparedness. Accordingly, the procurement of major new defense systems (also referred to as weapons systems) and the maintenance and upgrading of current defense systems, represent a significant activity of, and cost to, the Department of Defense. Through the years, threats caused by differing political philosophies in the international arena, and constant pressure to contain costs, have resulted in increased attention to defense system acquisitions and their management.

The success of the system acquisition efforts have, and will continue to depend on a close working relationship between the DOD and industry, as have these efforts since their inception in the 1940s.

In 1939, when the threat of Axis tyranny grew, President Franklin D. Roosevelt recognized the United States had a tremendous advantage in its free enterprise system. He knew what could be achieved if private industry were properly incentivized. He perceived American industry as an "Arsenal of Democracy" and provided the necessary incentives to make it so.

A year earlier, at the time of the Munich crisis, the President quietly ordered the armed forces to modernize their wartime production plans. Eighteen months before Pearl Harbor, the U.S. government began incentivizing industry and on May 14, 1940, the Congress authorized a buildup of 4,500 military airplanes. On May 15, as an afterthought, the Congress raised the total to 10,000 aircraft. Industry responded with great numbers of good equipment at competitive prices.

By August 1940, the U.S. shipyards had hired 80,000 new workers and aircraft plants had employed an additional 50,000 workers. As industrial plants grew overnight, the United States showed the world what its free enterprise system could do. The depression ended.

Two years before the United States entered World War II, our factories delivered about 3,600 military airplanes. During 1941, by exploiting the strengths of its free enterprise system, the United States increased production by more than 500 percent to more than 18,000 delivered military airplanes. That was surpassed by U.S. industry accomplishments after Pearl Harbor was attacked, and private industry was given the "green light" to proceed more quickly.

In 1942, the United States produced 47,000 airplanes. In 1943, it provided 85,000 airplanes to allied nations; in 1944, it provided 100,000 airplanes! The millions of defense systems and spare parts the United States produced during a 44-month period made it possible to win the conflict, and prevent enslavement of the free world. Without the support of U.S. industry, World War II would have been lost to the aggressor.

In a presentation before the National Security Industrial Association (NSIA) in November 1983, General James P. Mullins, USAF, provided some insights about this period in our history that are worthy of noting here.[1] General Mullins believes, "We may owe an even greater debt to our free enterprise system for its achievements during the post-war period because that's when we in this country faced an even greater menace (than we did during World War II). (The menace), unlike that of World War II, could have threatened the towns and cities in America's heartland, towns and cities which, until then, had been invulnerable."

General Mullins found that "As modern military technology evolved, and United States potential adversaries, especially the Soviets, developed strategic systems against which there was no defense, we were faced with building a strong and unquestioned deterrent, one quote could prevent an attack against our country, and ensure the survival of democracy. Considering the speed at which technology evolved, and the continuing pressure of an ever-growing threat from the Soviet Union, this had to be an undertaking of immense proportions."

Let's consider, briefly, requirements of strategic bombers. In 1945 we relied primarily on the B-29 bomber, but within two years the United States was producing a B-36 bomber because it needed a bomber that could fly almost three times as far as the B-29, 25 percent higher, and be capable of carrying four times the payload.

As U.S. military forces began taking delivery of 400 B-36s, a pure jet bomber was being tested. General Mullins indicated that"...with rapidly advancing technology, we could not risk relying on a deterrent force which couldn't effectively penetrate to the target. That's why, by 1951, we started receiving some 2,000 B-47s which could cruise two and a half times faster than the B-36s. That's why, within another year, the first of over 800 B-52s appeared on the scene because, already, we foresaw the need for a plane which could fly 10,000 feet higher than a B-47 and carry four times as many bombs....

"It was a remarkable period for the military, our private defense industry, and this country. It saw the foundation laid for what has proven to be the most effective deterrent ever known to man. Indeed, it showed, to friend and foe alike, what American free enterprise is capable of doing and above all else, it prevented another world war.

"Without the deterrent provided by the B-36s, the B-47s, and the B-52s — all systems designed and built by the "Arsenal of Democracy" — we almost certainly would have been involved in another great conflict. We, along with the rest of the free world, would almost certainly have paid a grievous price in terms of lives lost, property destroyed, and humanity degraded. That's why life, liberty, and the pursuit of happiness is, quite literally, the real heritage of our military-industrial complex.

During World War II, the United States fulfilled its requirements for defense systems in a profit-motivated, free-enterprise environment. By January 1961, when President Dwight D. Eisenhower gave his farewell address to the nation, he pointed out that the United States was facing a hostile ideology; therefore, the military establishment would have to provide the "vital

element in keeping the peace." "Our arms must be mighty," he said, "and ready for instant action, so that no potential aggressor may be tempted to risk his own destruction."

The United States really didn't have "an armament (defense) industry" until after the Korean conflict, Eisenhower explained. In previous wars, this country had been able to convert from producing "*plowshares*" to "*swords*" in time to meet any national emergency. At the start of the 1960's, however, Eisenhower indicated he found this approach no longer viable. A return to the plowshares-to-swords approach would be unwise because of the growing technical complexity of our defense systems and equipment; the long-lead times required for design, development, production and testing; and the attendant increased costs of defense systems. Had it returned to the *in extremis* approach to national defense the United States would have been left vulnerable to would-be aggressors.

Eisenhower felt that "the councils of government...must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex." Citizens in and out of government shared his concern and worried that a community of interests might develop that could influence the magnitude and direction of our domestic and foreign policies. Included in this community – the military-industrial complex – were corporation executives, military officers, civilian bureaucrats, congressmen and others. At the center of the community was the unique relationship between the DOD – the customer – and the companies in the defense industry – the contractors. Some patriotic citizens went so far as to say the United States had progressed from an arsenal of democracy to a military-industrial complex composed of a group of people concerned with only their own interests and welfare.

The question that required an answer in the early 1960s was this: Are government and industry keeping each other in check, or are they acting in concert to reinforce one another? In other words, would the DOD-industry teams coalesce to the extent that they would be free to operate without constraint? If this were to happen, the traditional balance normally maintained by our political system would be jeopardized. The answer, of course, was – and still is – that the traditional checks and balances must remain intact.

Chapter 9

Concept of Program Management

During the 1950s and 1960s, the concept of program management – technical, business and industrial management of selected tasks using a centralized management authority – evolved from the need for an organized approach to managing defense system acquisitions. The process of managing acquisitions consists of a complex cycle that commences with identifying a need for a system and conceiving a system to satisfy the need. The cycle ends – following deployment (or possible modification) of the system – with retirement from the inventory, or the expenditure in service as, for example, an air-to-air missile that has been fired. For our purposes, a program may be considered as an aggregation of controlled, time-phased events designed to accomplish a definite objective. Often a program involves a pyramid of contractually interrelated government, contractor, subcontractor and supplier organizations for long periods of time. In this complex environment, the performance of any organization can (and often does) affect others. Procurement methods and practices present a formidable challenge to each government-industry team established to manage a program. Experience gained following the Korean conflict indicated that successful completion of a program depends not only on the contractual environment, but also on an understanding and proper application of a number of management systems and good relationships developed in the DOD and the industry.

Beginning in the late 1950s, the initial framework for managing programs could be attributed to the Air Force Systems Command (and the outstanding efforts of Lt Col Benjamin N. Bellis, USAF) when it published a series of regulations popularly referred to as the "375 series." These regulations and the accompanying manuals were developed for use in missile/space programs where failure could not be tolerated. The 375 series detailed how defense systems acquisition should be managed from formulation of the system concept until the system was "phased-out" or expended in service. There will be a further discussion of this subject in Part Four.

As program offices for managing the systems acquisition process were organized throughout the Services, the nature of individual offices took a variety of forms. Some offices were highly-integrated and self-supporting; some were of a matrix type; others were highly-staffed and depended on a permanent functional staff for their support. The concept of a program office to manage the design, development, manufacture, test and evaluation, and support of a system proved to be sound; however, some offices were hampered in their activities by management layers, either by the staff within the Service involved, or by their own functional and/or supporting staffs, or by both.

Chapter 10

Principal Features of Program Management

To begin, we should recognize that every program, regardless of its size or the nature of the defense system involved, exhibits certain features in common with other programs. For example, a program generally contains five distinct phases in its life cycle: (a) exploration and development of defense system concepts based upon a recognized mission element need; (b) demonstration and validation of selected alternative concepts; (c) design, development, limited production, test and evaluation; (d) production; and (e) Service deployment, operation, and operational support of the defense system.[2] The fifth phase may also include product improvements, planned and unplanned. Within each phase there are discrete and specific events that must occur before the program advances to the next phase. The program life cycle represents a meaningful and understandable framework into which virtually every action, event, document, responsibility and authority bearing on the management of the program can be fitted. Figure 1 depicts the evolution of the major defense system acquisition life cycle through the years.

When the contract for a program is negotiated and signed, it represents – in an implied sense – a partnership agreement between the customer and the contractor. It does not mean that by awarding the contract, the customer relinquishes responsibility for program performance.

The government program manager ties together, manages and directs the development and production of a defense (weapon) system that meets performance, schedule and cost objectives (a defense system defined by the Service or Services involved and approved by the SECDEF). The essence of the program manager's role is to be the agent of the Service for the management of the system acquisition, and to focus authority. He has not only the Service responsibility for running the program, but the vantage of a large perspective of the program and the interrelationships among its elements. He must be the major motivating force for moving the defense system through its evolution.

The leader to whom the government program manager reports is like a general manager in industry. The comparison is especially apt. It seems impossible to write a meaningful position description for the company job. It seems equally impossible to write one for the government program manager's job. What the general manager does is whatever needs doing to move the affairs of the company's business. He may do one thing at one time and another thing at another time. He does what is most needed at the moment to achieve his objectives. The general manager is not the "doer" of any job – other managers are charged with the "doing." The general manager sees that what he wants done gets done. What he wants is to have things done in harmony in achieving his objectives. He must rely on others to do the work; but he must direct, control and coordinate the work so no one aspect of it dominates the others to the detriment of the harmony of the whole.

Perhaps the most important function of a program manager in government or industry is to ensure people communicate effectively with each other, achieve a common understanding of the program needs, and recognize their place in the total program effort.

The concept of program management evolved because the ordinary way of doing things was not always adequate in the past. Extraordinary management — program-oriented management — is often essential, if all aspects of a defense system program are to be handled expeditiously and correctly.

A program manager must be free to exercise judgment and flexibility. He should be able to operate in an environment in which he can select and tailor the specific needs of his program to those management systems and formal techniques that will help his program. He should be able to operate in an environment conducive to the exercise of good judgment. There is no pet formula he can adopt. He must decide what methods and techniques he will use. Because he is responsible for planning, directing and controlling the program, he must have the authority to get the job done.

The program manager must adapt standard techniques to the peculiar requirements of his program. In turn, he must have a right to expect that those in the government (or in the company) who are going to approve his management plans and techniques will exercise their power of approval properly. The program manager's plans will not be judged by the standard of meticulous compliance with innumerable details hidden away in regulations, directives, instructions, handbooks, manuals, standards, specifications or similar documents.

Program managers often must to struggle to obtain the management flexibility they are supposed to be given. Higher authorities, especially those in their staff organizations, sometimes tend to standardize requirements and insist on using familiar techniques and methods. The initial disposition of higher authorities may be to avoid changes and exceptions to the general rules. If this is so, requests for deviations will rarely be conceded without being pushed and sold.

In the real world, there are often several programs competing for limited resources. Many functional organizations must support the normal activities of their parent organizations — the day-to-day, nonprogram type of activities. If personnel are not available to support all demands, the program manager may receive less support than he needs.

Another problem the program manager faces is that functional specialists tend to feel their discipline is the central core of a successful program. The commitment to their specialty may lead them to try dictating to the program office what *will* or *must* be done, instead of, providing advice as to *what* should be done. Also, there is no lack of regulations with which they can register their claim. One of the most difficult concepts to convey to functional specialists is that the program manager is responsible for determining *what* will be done; whereas, the functional specialist is responsible for *how* it is to be done.

The program management environment, therefore, places an extraordinary premium on talent for leadership as distinguished from command – on persuasion as distinguished from direction. This environment requires an emphasis on informal authority, *de facto* authority. Someone has said this authority as derived in part from the program manager's "persuasive ability, his rapport with extra organizational units, and his reputation in resolving opposing viewpoints within the parent unit and between the external organizations."

Like a general manager, the program manager must rely on others to do the work. He cannot escape responsibility for the result. If responsible, he must be satisfied that what is done on his program makes sense to him and is consistent with his plans. If he cannot be persuaded it is right for his program, he must direct it to be done as he wants.

Much has been said about "disengagement" – letting industry do its job contracted for the government. The goal is laudable and entirely consistent with good management concepts; however, on a defense system program the ultimate responsibility for its success rests squarely on the Service and its program manager. The program manager must manage the contracted work on his program. It is not really a question of whether he manages, but a question of how he manages or mismanages.

In the final analysis, government and industry program managers must keep in touch with what is going on above them. They have to be aware of what is expected of them by higher authority. They should know the typical questions being asked at major program review points, and they should recognize the requirements for information by higher authority will be constantly changing.

The confidence of a superior is the foundation of rapport between him and his program manager. It contributes to the program manager's receiving authority. When it is obvious to functional managers supporting a program that the program manager has the confidence of his superiors, he does not have to rely as much on formal authority. This confidence can be instilled by demonstrating a knowledge of the program in the widest context, knowledge of the threat, the direction in which the threat is evolving, other systems in the inventory that address the threat, program schedules, costs, and technology. In short, it embraces everything important to the program.

The government program manager must be keenly aware of how the contractor is managing the program. For example, the contractor's organization is of concern to the government program manager, but to a lesser degree than the operation of his system for planning, scheduling and controlling the program effort. The contractor's system for allocating resources, authorizing work, and evaluating its own and subcontractor performance are vital concerns to the government program manager.

National security objectives provide the guidelines for initiating new defense system programs and continuing or deleting existing programs. These objectives come from many sources: presidential statements; results of National Security Council deliberations; intelligence

reports and estimates; and national and international political, economic, military and social factors.

Now, we will examine how managing defense acquisitions has matured and how it has been affected by changing management philosophies for conducting DOD business throughout the past four decades.

Chapter 11

Basic Procurement Process

Following a low volume of major defense systems business after World War II (the late 1940s), the Korean conflict and general deterioration in the international situation at that time led to an expansion in developing and producing defense systems. During the latter half of the 1950s, defense systems sales were stable, and a gradual transition from long production runs to more research, development test and evaluation began.

The process of acquiring major defense systems in the 1950s was complex. Military procurement programs lasted many years at a high cost. Nevertheless, the basic process for procuring defense systems included all functions that normally pertain to acquisition of goods or services, that is:

- Preparation of a description of the requirement (need)
- Solicitation and selection of source(s)
- Negotiation and award of contract
- Administration of the contract.

Key steps in the procurement process during the 1960s and 1970s are illustrated in Figure 2. In a specific procurement, the variables like (1) statutes and regulations that apply, and (2) urgency of satisfying the requirement, may impact actions to be taken in each step and/or sequencing of steps.

During the 1950s, defense business was characterized by rapidly-advancing technology; concurrence in design, development and testing; and cost-plus-fixed-fee contracting. Emphasis was on developing and producing defense systems incorporating the most advanced technological innovations. This led to a high risk for failure.

Money was authorized to develop almost any new defense system appearing capable of giving the United States a performance advantage over potential adversaries. Considerations like "should-cost," "design-to-cost," and "life-cycle cost" did not become uppermost with defense system planners until the late 1950s. Development production took place under cost-reimbursement contracts. In this environment, production costs did not pose a major constraint on engineering design. When a design was discovered to be impractical in production — or to be inoperative in field use — it was modified in accord with government-funded engineering changes.

Toward the end of the 1950s, a new trend appeared. The government looked over the shoulders of the defense contractors. At that time, the United States accelerated its pioneering program in ballistic missile development and production. High risks and costs of these programs,

which employed concurrency of development and production, could not be borne by industry alone. Heavy reliance had to be placed on sole-source procurement because competitive capabilities were not developed. By 1960, a majority of contract awards by the Air Force were noncompetitive, and more than 40 percent of the awards were cost-plus-fixed-fee contracts.

Chapter 12

System Engineering and Life Cycle of a Major System

Large, highly interactive systems were on the forward edge of technology. These systems had a natural process of evolution, or life cycle, in which actions taken (or not taken) in early stages meant the difference between success and failure. When the outcome is certain only after spending large sums of money, even wealthy nations cannot afford many failures.

System Engineering

From the start, system engineering represented an attempt to prevent failures by a unified approach completely defining all requirements of the system, and establishing a system configuration, proved earlier, to be capable.

System engineering is the application of scientific and engineering efforts to (a) transform an operational need into a description of system performance parameters, and a system configuration by using an iterative process of definition, synthesis, analysis, design, test and evaluation; (b) integrate related technical parameters and ensure compatibility of all physical, functional and program interfaces in a manner that optimizes the total system definition and design; (c) integrate reliability, maintainability, safety, survivability, human and other such factors into the total engineering effort to meet cost, schedule and technical performance objectives.

System engineering often is called a "front-end" process; that is, most system engineering tasks are completed in the initial phase of the project/program, when about 5 percent of program funding is expended. This initial effort results in defining configuration and size of the system and its logistics support. The resulting program commitment of funds typically represents 90 percent of program life-cycle costs. Accuracy and completeness of the early system engineering effort are, therefore, essential to maintain a program within budget constraints. Consider the relationship of the system acquisition process to the system life cycle, and how the system engineering task and skills change as the program progresses.

Program success is measured in terms of cost, schedule and technical performance. A critical factor in program success is organizing the program, including the people, effort, and the system itself. Definition of the system hierarchy permits allocation of functional requirements to defined program elements. This, in turn, permits assignment of responsibility for development to specific organizations or groups. The work breakdown structure (WBS) then defines all tasks to be performed on the program and relates directly to program organization and system hierarchy.

The foundation of a successful program, however, is planning, the basis for which is the program master schedule. With a master schedule, plans can be developed for system engineering and specialty areas (reliability, maintainability, safety) to define tasks, procedures and schedules.

A procedure is needed for developing and documenting interfaces, together with methods for interface control, to ensure changes are properly reviewed and the total impact assessed before implementation.

In simplest terms, system engineering is a technical process and a management process. To complete system development successfully, both aspects must be applied during the system life cycle, which begins with needs, constraints and capability requirements to satisfy mission objectives by applying technology. System engineering is most active in the planning period and in conceiving the system concept and defining system requirements. As detail design is finalized, system engineers resolve interface problems, do trade-off analyses, and assist in verifying performance. During the production phase, system engineering primarily is concerned with verifying system capability and maintaining the baseline system. During the operations period, system engineering evaluates changes to the system, establishes their effectiveness, and facilitates the effective incorporation of changes and modifications.

Life Cycle of a Major System

The life cycle for a typical major system acquisition in the 1950s is shown in Figure 12. From establishment of the need to place the system into operation, system engineering was an iterative process whereby individual aspects of the program like design, costs or risks, were successively reviewed at designated milestones, and the need recertified before additional resources were authorized by the reviewing authority for continuing the program. Management made a milestone decision only after a formal review or audit of the contractor effort. These reviews, which increased in depth of detail as the system life cycle progressed, formed the basis for presentations program managers used to justify further program development. It must be emphasized that for an actual program, management decided to continue the present phase, proceed to the next phase, or cancel the program.

At the start of a major procurement, before Milestone I, contractor effort was limited to government support in specific study areas like communications or payload, where the government study team may have had little expertise. This effort usually was accomplished with a small study group that evolved and evaluated concepts to accomplish a specific mission need.

Government Program Office

The government program office was headed by a program manager responsible for program progress. His staff included the areas shown in Figure 13, except for configuration and data management, which were added in the 1960s. He may have had outside consultants. Because the system engineering staff was usually small, the program manager may have had to depend on the contractor's system engineering organization, or on an outside contractor to perform detailed system engineering tasks and produce necessary documentation.

Contractor's Organization

The contractor's organizational structure depended on the size and nature of the program, the government program office organization and the contractor's organizational structure. The contractor may have been organized in one of several ways. He may have had a purely functional organization as shown in Figure 14. This had the advantages of no organizational changes required to implement new programs, no duplication of talent, and high-technology transfer. Its disadvantages were unclear customer interface, difficult cost/schedule control, unclear communications and control channels, and lack of program recognition and personnel loyalty. For these reasons, it often was not used on major systems.

The pure project organization, shown in Figure 15, overcame some problems with stronger control, better communication and program loyalty. However, this organizational approach tended to be inefficient in that different skills were needed as programs progressed through the acquisition process.

Combining the two approaches resulted in the matrix organization shown in Figure 16. In this approach, the technical personnel had a "home" specialty organization and were assigned to a program as the need for their service arose. The matrix organization had the advantage of a clear customer interface with single point accountability, short communication channels, high control capability, and assured technology transfer. Because there often is competition for resources, this approach required cooperation of management to function effectively and to ensure the "two-boss" syndrome did not cause personnel problems. The matrix-organization approach was used by many companies developing large systems.

Chapter 13

How Industry Approached Management of a Program

In the 1950s, industry had to learn to manage defense system programs in an efficient manner and to interface effectively with the Service program management office. Perhaps the best way to describe the approach taken on many successful programs is the matrix-management approach they employed. Here, I discuss program-manager duties in a matrix-management organization, nature of the program-manager charter, and the relation of the program manager to executive management, functional management, the customer and associate contractors, subcontractors, and other participating organizations within a company.

Program Manager Duties

The program manager in an industrial concern with a matrix-management structure usually was given authority and responsibility for carrying out the following duties:

—Representing the company to the customer and associate contractor(s) and controlling interfaces between the company on the one hand and the customer or associate contractors on the other

—Defining for participating organizations, including subcontractors, the exact nature and extent of the contribution each was to make to the program and the constraints under which this contribution is to be made

—Establishing program master plans and schedules and making necessary revisions thereto

—Establishing program budgets, including provision for management reserves, and authorizing revisions thereto

—Authorizing and directing participating organizations to proceed in accordance with program directives in a traceable chain from primary program documents to work-package authorizations or the equivalent

—Analyzing the current and projected status of the program based on grass-roots reporting of cost, schedule and technical performance accomplishment against plans, with particular attention to variances, problems and program deficiencies

—Developing integrated solutions to program problems that would optimize the program position relative to cost, schedule and technical performance and ensure compliance with contract and program requirements

— Initiating corrective action to rectify program deficiencies including identifying for executive management and functional management the actions necessary within their competence to achieve program objectives

— Organizing and staffing a program management organization or office, if one is required to fulfill the duties specified above

— Performing certain other duties that have particular relevance to effective accomplishment of the program manager's total assignment; e.g., evaluating and acting on proposed or directed program changes, chairing a program configuration control board (a practice starting in the 1960s), providing an inquisitive and aggressive surveillance of program accomplishment, maintaining good liaison with all program participating organizations, providing leadership and discipline, doing administrative functions incidental to management, and evaluating performances of key program team members in review of merit increases and promotions.

Nature of Program Manager's Charter

The general authority and responsibilities of the program manager had to be set forth. The specific duties and accountability of the program manager usually were contained in an appropriate charter, coordinated with functional management and approved and issued by executive management.

A typical program manager's charter generally included the following:

— Identification of the program

— Scope of the program manager's assignment

— Identification of the program manager's superior

— Delegated authority for control of resources

— Organization chart for the program management organization, including all identified program management elements

— Responsibilities of the program manager plus those contained in existing policy, systems and procedures and approved exceptions or deviations therefrom

— Relation to specific supporting functional organizations, including any specific delegation of "element" responsibilities thereto

— Identifying members of the program management team.

The program manager's charter generally was prepared and issued at the time of the program manager appointment and was maintained and updated, as necessary, as the program progressed through phases of the life cycle.

Chapter 14

Program Manager Relationships in Industry

Relation of Program Manager to Executive Management

Within a company, executive management was responsible for successful achievement of program objectives.

The cognizant member of executive management usually assigned the program manager with publishing an appropriate charter. The program manager and his organization as well as functional management became accountable to a cognizant member of executive management for effective and efficient performance of their assigned duties on the program, both general and specific.

The program manager conducted appropriate program review (as necessary) for the cognizant member of executive management, to ensure the new program is initiated properly or the on-going program was achieving stated objectives.

Relation of Program Manager to Functional Management

Before contract award, participating functional management reviewed anticipated program requirements to ensure the company is functionally capable to meet prospective contractual commitments. If in doubt about the company's ability to meet requirements in view of these capabilities, the program manager and cognizant functional policy-makers met with executive management to plan a course of action.

Functional management generally supported the program operations:

— By providing functional resource capabilities for, and conducting effort on, assigned program tasks in accordance with program-directed plans, schedules and budgets

— By accounting to program and executive management for technical excellence of their effort, methods for accomplishing the work, assignment and competence of those performing, adequacy of facilities, and quality of output — on time and within schedule

— By designating appropriate individuals as program management team members as required by program management, and reviewing such team members for merit increases and promotions in coordination with program management.

The functional policy-makers within the company supported program management by:

— Providing functional policy and procedure to their functional counterparts on assigned programs for the effective integration of operating procedures with program management systems, and maintaining surveillance of program status with reference to their functions and providing assistance and coordination to program managers and functional managers in resolving program problems.

In the conduct of a program, disagreement could arise between or among program authorities, like the program manager and the functional manager(s). When this occurred, timely resolution of differences was essential if the program was to meet objectives (targets). Executive management was called in if the problems could not be resolved.

Relation of Program Manager to Customer and Associate Contractors

The program manager usually represented the company in contacts with the customer and associate contractors in matters affecting the program. Systems and procedures to regularize this relationship often were developed and implemented in accordance with the following criteria:

— Interfaces with the customer and associate contractors were made the subject of a separate element of program management (sometimes called "interface management"), the primary concern of which was coordination and documentation of interface relationships, particularly applicable plans and schedules and their monitoring

— The program manager was required to conduct all necessary contacts with the customer and associate contractor(s) relative to cost, schedule and technical performance requirements

— Technical aspects of the interface between program management and the associate contractor(s) was determined largely by the nature of the interface control documentation. One major responsibility of the program manager (usually in the system engineering management element) was controlling the interface documentation

— On programs where associate contractors were assigned integrating or system engineering responsibilities, often with contractual authority to give technical direction or approve technical documentation, the program manager was required to ensure the program contract clearly stated the company's contractual provisions and obligations. Program management systems and procedures were provided to facilitate good working relationships with associate contractors and to specify conduct and functions of resident representatives.

Relation of Program Manager to Subcontractors

Interface with subcontractors was maintained as a functional responsibility of a material (purchasing) organization. Program management communicated program requirements, master plans, schedules and resource allocations through the material organization to the subcontractors. Changes to the subcontract affecting cost, schedule or technical performance were coordinated with, and approved by, the program manager before issuing a change notice to the subcontract.

Relation to Other Participating Organizations Within Company

In a large corporation, other operating divisions performing work in support of program management were responsible for accomplishing program tasks in accordance with program management plans, schedules and resource allocations as indicated in appropriate work-authorizing documents. This responsibility generally included supplying reports on cost, schedule and technical performance accomplishment, as designated in applicable work authorizing documents. Functional organizations in other operating divisions performing work usually are held accountable to immediate superiors for its technical excellence and performance within designated cost and schedule constraints.

This, in general, represented the program manager's role in a matrix-management structured industrial concern and relationship to others, inside and outside the company. This approach still will prove successful in the 1990s.

Chapter 15

Need for a Planning, Programming and Budgeting System

The DOD did not have an orderly integrated planning, programming and budgeting system during the 1950s. Although James V. Forrestal, the first Secretary of Defense (SECDEF), took steps to create a uniform budget structure for use by military departments, planning and budgeting by each department took place in relative isolation from the others. Consequently, plans prepared by each military department were based upon (1) the kind of war that department envisioned, and (2) reliance of that department on its resources. This led to overlapping of functions, duplication of missions, and occasional capability omissions.

Military planning was hardware-oriented and looked ahead 5 years. On the other hand, military budgets were separated into appropriation categories (input-oriented) and unconstrained by the Office of the Secretary of Defense (OSD). As a result, military departments tended to submit budgets higher than the SECDEF or the Congress could accept. The OSD budget, prepared by the ASD (Comptroller), did consider fiscal realities, but only projected requirements for 1 year ahead. The Director of the Budget in the Bureau of the Budget, now the Office of Management and Budget, (OMB), established the final defense budget. Several changes were needed to correct problems and for an integrated process:

— An orderly, coordinated system had to be developed

— The OSD had to provide fiscal guidance to the military departments

— Planning had to be guided by OSD, and communications among military departments had to occur

— Planning, programming and budgeting had to be focused on national security objectives for a specific number of years

— Better communication with the Bureau of the Budget had to occur.

Lack of a well-organized and integrated DOD financial management system and "piecemeal" procurement led to unstable employment in the defense industry and emergence of a transient work force. Many contractors being challenged to develop and produce defense systems on the outer fringes of technology found it difficult to create and maintain smoothly-functioning program management teams.

Chapter 16

Foreign Agreements

During World War II, the defense industry had become a significant factor in the U.S. economy. The DOD budget had grown to about 50 percent of the federal budget. It continued to be a major part of the federal budget while the defense system acquisition programs were being conducted to support the Korean conflict and a limited number of military assistance/grant aid agreements with allied countries. The military assistance program (MAP) continued throughout the 1960s and 1970s, but at a lower level. In the early 1980s, there was sentiment in the Congress to phase out the MAP. From 1950 through the 1980s, the foreign military sales (FMS) program, involving the sale of U.S. military goods and services – as well as training – to U.S. allies, continued.

According to the Foreign Military Sales Act, as amended in 1968 (Public Law 90-629), the United States was to be reimbursed for not less than the value of the goods and services being transferred. Further, all costs, including a reasonable contribution to sunk investment costs, were to be recouped. In the amended act, FMS became the responsibility of the International Security Agency (ISA). This agency was geared more to meeting demands by selling from the inventory than to procuring major defense systems for allies through the defense system acquisition process.

As transition from military aid to military trade was taking place between the United States and its allies, European members of the North Atlantic Treaty Organization (NATO) began to see the need to develop and protect their industrial bases. This was particularly true of members capable of developing and producing defense systems. With this as a backdrop, and because of the high cost of developing, producing and fielding new defense systems, the tendency to form multinational corporations grew.

Part Two Information Sources

1. General James P. Mullins, USAF, Commander of the Air Force Logistics Systems Command, presentation to the National Security Industrial Association, November 1983, Los Angeles, California.

2. Development and production have sometimes been combined into a single program phase.

PART THREE

DECADE OF THE FIFTIES

NOT AVAILABLE
FOR PUBLICATION

PART FOUR

DECADE OF THE SIXTIES

Chapter 20

Five Year Defense Program

The defense system acquisition environment began to undergo marked changes in the early 1960s. After a decade of experience with the acquisition of high-technology defense systems, DOD attention began to shift toward integrated planning and programming, and to using available resources more efficiently throughout the defense system acquisition process.

On January 21, 1961, Robert S. McNamara, a former corporate executive, became Secretary of Defense. During his first year in office, he decided to centralize the authority and planning for the defense establishment at the level of the Office of Secretary of Defense and to decentralize operations. Although centralization of the planning and operational decisions came about eventually, decentralization of operations was not realized during his term of office.

Among the beneficial changes introduced by McNamara was the Five Year Force Structure and Financial Plan, better known as the Five Year Defense Plan (FYDP). The FYDP was a register of all currently approved programs, along with their funding and manpower levels. Serving as the pivot of the entire defense programming system, it grouped all military forces and all defense systems according to their principal missions, without regard for Service affiliations. In the FYDP, resources (inputs) — manpower, defense systems, and installations — were related to the military functions (outputs).

The 10 major programs of the FYDP are listed in Figure 3. Programs 1 through 6 and Program 10 had a force-mission or combat-mission orientation. Programs 7, 8 and 9 had a support orientation. Because program resources overlapped various management areas as well as functional responsibilities, no one program remained the exclusive responsibility of a single Assistant Secretary of Defense.

The major force programs of the FYDP were composed of program elements. These elements were the smallest units of military output controlled at the OSD level. Each element constituted an identifiable military capability that contributed to the mission of a major program. Costs were measured in terms of the amount required to finance the program element in a given year. By 1980, there were about 1,100 program elements serving as basic building blocks in the programming process.

In addition to the major programs of the FYDP, OSD and the Services used functional programs — such as the Telecommunications and Command and Control Program; the Communications Security Resources Program; or the General Defense Intelligence Program — to manage certain resources that cut across program element or appropriations boundaries.

The FYDP was updated three times a year. The most important update occurred in January when the document was revised to reflect the President's budget. This edition of the

FYDP served as the DOD planning and programming baseline for the ensuing year. In May or June, each Service Secretary approved the program objectives memorandum (POM) prepared by his organization for the next budget cycle, and OSD issued an update to the FYDP to reflect the Service POM inputs. In September, the SECDEF concluded his review of the Service POMs and revised the Service programs as necessary. The OSD then issued another update to the FYDP reflecting the SECDEF program decisions with respect to the POMs. This issue of the FYDP (1) was used in negotiations with the Office of Management and Budget prior to the first of January, and (2) served as the basis for the creation of the Service budgets to be forwarded to the Congress the first of January. In January, the cycle began again.

In October 1965, McKinsey and Company initiated a study to determine how to improve the programming process in DOD. Based on the results of this study, the SECDEF began the annual programming cycle by publishing a list of major force-oriented issues that would have major impact on our armed forces. To prepare this list, the SECDEF used the military guidance provided by the Joint Chiefs of Staff (JCS) in the joint strategic objectives plan (JSOP) and the advice of the OSD systems analysis organization.

In addition to listing the issues, the SECDEF initiated the draft presidential memorandum. This document, treated as a privileged communication from the SECDEF to the President, covered the tentative programming events being considered by DOD during the next fiscal year.

In 1968, the SECDEF began the annual issue of logistics guidance and 18 other guidance memoranda. Soon after, the SECDEF issued the first development concept papers (DCP), which will be discussed in more detail later.

Chapter 21

The Planning, Programming and Budgeting System

To make the FYDP work, McNamara introduced another management tool – the planning, programming, budgeting system (PPBS). See Figure 4. The SECDEF recognized that realistic force planning must be based on the military strategy the United States wishes to follow in accomplishing national security objectives. In the development of a suitable force structure, fiscal, manpower, research and development, and production constraints must be applied. Also, adequate consideration must be given to the risks imposed by resource constraints. The PPBS took these factors into account, and served as an integrated system for establishment of the annual DOD budget and the periodic revisions to the FYDP.

The PPBS was a cyclic process containing five distinct, but interrelated, phases, namely: (1) planning, (2) programming, (3) budgeting (4) executing the programs approved by the Congress, and (5) maintaining accountability and reporting results. The fifth phase also included preparing future plans, programs and budgets, as well as supplying financial status information to DOD managers.

The broad categories of major programs – upon which the planning was based when the PPBS was introduced – were sometimes referred to as the "Hitch Program of Packages" after *Charles J. Hitch,*[1] *then Assistant Secretary of Defense (Comptroller).*

From 1961 to 1969, the PPBS was a centralized decision-making activity with McNamara, Hitch, and Dr. Alain C. Enthoven acting as principals. As in the 1950s, the programs submitted by the military departments contained no fiscal constraints. Thus, the budgets were unrealistic and, in most cases, had to be severely slashed at the OSD level. With time serving as a critical factor, OSD management had to make significant program decisions without giving the military departments an adequate opportunity to defend their plans, programs or budgets.

In 1969, the PPBS was modified by the new SECDEF, Melvin R. Laird, to permit some decentralization of the decision-making process. The SECDEF requested that the program and budget submissions made by the military departments fall within the explicit fiscal constraints that he would establish annually. From that time on, fiscal guidance became the principal constraint on the military departments during the development of their plans and budgets. The departments recommended the total program objectives – in a program objectives memorandum (POM) – for the forthcoming budget year and the four subsequent years within explicit fiscal constraints. This change to the PPBS shifted competition for financial resources from OSD to the military departments and into the programming phase of the PPBS.

The POM was a document prepared by each military department and defense agency in a prescribed format for submittal to the SECDEF. The document contained a recommendation covering the total resources required by the department or agency within the parameters set forth

in the SECDEF's fiscal guidance. To develop the POM, each military department and defense agency had to determine how it proposed to allocate and prioritize limited resources in a multimission environment among competing needs to maximize combat capability. Included in each POM is an assessment of the risk associated with current and proposed forces and support programs.

Chapter 22

Systems Analysis

During his eight-year term, McNamara introduced to DOD another management process, systems analysis. This process, which was to become an integral part of the PPBS, had been known in the industrial world as a "cost-effectiveness study." An OSD office was created and given responsibility for conducting studies and analysis of the resources required, in terms of cost, to accomplish specific defense objectives.

Dr. Enthoven, who was appointed to head a small systems analysis section in the Defense Comptroller's office in 1961, became the Deputy Assistant Secretary of Defense (Systems Analysis) in the fall of 1962, and Assistant Secretary of Defense (Systems Analysis) in September 1965. Throughout this period, Dr. Enthoven's office was the primary action office for the major force-oriented issues. The Office of the Joint Chiefs of Staff served as the office for collateral action. The military departments and defense agencies were given responsibility for reviewing and commenting on proposed plans and programs for dealing with critical issues affecting U.S. security.

Hitch encouraged industry to conduct independent studies and analyses to determine what contributions it could offer to improve existing defense systems and to provide suggestions for new ones. By such efforts, Hitch believed industry would be able to anticipate some of the DOD decisions regarding the future content of the FYDP.

The systems analysis approach advocated by McNamara had worked well in the industrial world where its success or failure could be determined by profits. In the DOD environment, however, it was difficult to determine the effectiveness of each decision. While difficult to determine, cost-effectiveness had to be measured to deal with the problem of limited resources. Unknowns such as how much "security" additional quantities of a specific defense system will provide, limit management's ability to determine precisely the correctness of a decision. There was no known way to assign a price to such a decision. The big question to be answered by defense planners and decision-makers will always be: "What types and quantities of defense systems are required to meet the national security objectives within available resources?"

By the close of McNamara's term in 1969, the FYDP and the PPBS were firmly established. The FYDP and the PPBS brought some order to the annual budget cycle, and, with the adoption of systems analysis techniques, improved the process of allocating scarce resources. Although some participants were not completely satisfied with the effectiveness of the McNamara approach, it did help the DOD mission to conform to overall national security objectives.

Chapter 23

Contract Administration Organization

In the early 1960s, each military department had a contract administration service organization composed of a headquarters office and several field offices. The field offices were organized by function, commodity or geographical area. Because this appeared to be a cumbersome arrangement, the ASD (Installations and Logistics) launched Project 60. The purpose of this project was to develop a plan for an effective DOD-wide contract management organization. The project was completed in 1963 and the DOD contract administration structure was the outgrowth of the recommendations made in the final report.

Chapter 24

Harvard Study

In 1962, the Harvard Weapons Acquisition Research Project report covering 12 major defense systems showed that, on the average, the quality of the defense systems being produced tended to exceed their original specifications. This quality was being achieved at the expense of development time (development time averaged 36 percent longer than predicted), and costs (costs averaged as much as seven times more than originally estimated). To rectify this situation, OSD management issued the following directions:

— Make defense system costs equal in importance to performance and scheduled delivery to the inventory.

— Eliminate "gold plating."

— Increase competition at the start of a new program.

— Reduce the number of cost-type contracts, particularly cost-plus-fixed-fee contracts.

This report was received favorably by the OSD. Corrective actions were taken. A dramatic reduction in the number of cost-plus-fixed-fee contracts took place. Incentive and fixed-price contracts became the vogue to facilitate competition. The contracts took into consideration technical risks the contractors had to assume, as well as the resources (men, machines, money and facilities) required.

Chapter 25

Life-Cycle Cost

Life-cycle cost (LCC) – the total cost of acquisition and ownership—became a consideration in defense systems acquisition in the early 1960s when the Logistics Management Institute, under the sponsorship of the ASD (Installations and Logistics), conducted an investigation and recommended the concept be applied to defense programs. At the outset, it was applied on procurements at the equipment level. Following issuance of DOD Directive 4100.35[2] (devoted to planning for integrated logistic support) and a tightening of the defense budget, application of LCC at the systems level became a requirement to support planning. Several major defense systems programs, such as the Navy LHA, the Air Force F-15, and the Army SAM-D, employed some type of life-cycle costing technique on a trial basis. Then, issuance of the following directives accelerated the adoption of life-cycle costing on all major programs:

—DOD Directive 5000.1,[3] which changed the mode of defense systems acquisition

—DOD Directive 4105.62,[4] which made life-cycle costs one of the principal considerations in the selection of contractual sources for major defense systems

—DOD Directive 5000.28,[5] which made design-to-cost a major acquisition policy. According to this Directive, "The LCC of a system is the total cost to the government of acquisition and ownership of that system over its full life. It includes the cost of development, acquisition, operation, support and, where applicable, disposal."

The influence of time on a program manager's ability to curb costs is dramatically illustrated in Figure 5.

Chapter 26

Relationships Among System Engineering Management, Configuration Management, and Other Management Systems

Some of the terms associated with system engineering and configuration management have been defined as follows:

—*Engineering Process.* The reiteration, through all levels of a product-oriented, work breakdown structure, of the definition, synthesis, evaluation and specification processes necessary to convert (1) operational, reliability and maintainability requirements, and (2) test and inspection results, into functional, allocated and product baselines, which, when converted into hardware and operational software, will provide acceptable operational effectiveness.

—*Definition Process.* Definition is the application of scientific and technical knowledge in identifying and describing the major physical parts and functional areas at any level in a work breakdown structure. It may include system logic diagrams, block diagrams, schematic diagrams, parts lists and pertinent operational, organizational and logistics considerations and concepts.

—*Synthesis Process.* The application of scientific and technical knowledge in determining possible orderly arrangements of hardware and software which can comprise the defined item.

—*Evaluation Process.* The process of determining the best orderly arrangements of hardware and software to meet the defined requirements within the appropriate policy, technical, resources and schedule constraints.

—*Specification Process.* Preparation, in accordance with appropriate standards and other constraints, of documentation, including drawings, lists, reports, etc., comprising the functional, allocated and/or product baselines.

How system engineering management interfaces with configuration management and with the total management of a program or project are outlined below.

—*Contract Definition.* During contract definition, the systems engineering process generates the technical data and documentation that forms the basis for development and engineering during subsequent phases of a program or project.

—*Work Breakdown Structure (WBS).* System engineering identifies and structures the configuration arrangement of the system hardware, software, facilities and support

elements, which, when combined with the management structure of the project (contracting, controlling, reporting, etc.), evolves into the total program WBS.

—*Configuration Management.* The system engineering process provides the initial configuration baseline to which configuration management is applied. Thereafter, configuration management is an interfacing function that provides the tool whereby systems engineering reviews all design change activities to ensure overall system integrity.

—*Data Management.* The system engineering process generates applicable technical data. Thereafter, data management is an interfacing function that provides a tool whereby system engineering reviews the development of internal and/or deliverable data to ensure the logical and timely documentation of the system and ensure the validity and utility of the data for purposes intended.

—*Product Assurance.* The system engineering process provides product assurance with the technical criteria and test requirements needed to evaluate and maintain overall system integrity throughout the acquisition phase of the program. Product assurance provides system engineering with the feedback necessary to correct observed deficiencies noted during this phase.

—*Integrated Logistics Support (ILS).* The system engineering process provides a basis for the determination of the maintenance, logistics and personnel support philosophy and operational concepts through the development of overall plans and requirements compatible with the total system definition and design. The system engineering process reviews ILS requirements to ensure their compatibility and integration with the total system.

—*Cost/Schedule Control Systems Criteria (C/SCSC).* The system engineering process provides conditions that are prerequisite to a valid application of C/SCSC. Credible cost and schedule visibility critically depend on a well-defined scope of work and the definition of the detailed tasks necessary for the accomplishment thereof. These result from the system engineering process. Technical performance measurement must also be based on the results of the system engineering process.

—*Technical Performance Measurement (TPM).* The design assessment function of performance measurement estimates through engineering analyses, or measures through tests, the values of essential performance parameters of the current design of system elements. It forecasts the values to be obtained through the planned technical program, and determines the impact on system effectiveness measures of differences between these values and those allocated to the system element by the system definition function of system engineering. Technical performance measurement is a function of system engineering and is complemented by cost and schedule performance measurement in the overall performance measurement process. The C/SCSC assumes design sufficiency of the

system element to which a task is contributing. TPM is the complementary function to verify design sufficiency.

Why Configuration Management? The aim of configuration management, like the processes of systems engineering management and logistics management it supports and serves, is to enable and facilitate the timely conversion of a military need or opportunity to hardware that will perform as required, and that can be produced, operated and supported, as planned.

Configuration management policy, as it was established by DOD Directive 5010.19 and implemented by DOD Instruction 5010.21, was applied to new contracts by means of four military standards and a specification which were developed concurrently with the policy documents and released in 1964.

What is Configuration? The configuration of an item (or product) is a collection of its descriptive and governing characteristics, which can be expressed (a) in functional terms, i.e., what performance the item is expected to achieve, and (b) in physical terms, i.e., what the item should look like and consist of when it is built. In practice, an item being developed is described and governed primarily by its intended functional characteristics (with some physical characteristics usually being specified). Following development, however, an item being produced for inventory is ordinarily described and governed by its physical characteristics.

What is Configuration Management? Configuration management is a discipline that integrates the technical and administrative actions of identifying and documenting the functional and physical characteristics of an item during its life cycle, controlling changes proposed to these characteristics, and providing information on the status of change actions. Thus, configuration management is the means through which the integrity and continuity of the design, engineering and cost trade-off decisions made between technical performance, producibility, operability and supportability are recorded, communicated and controlled by program and functional managers.

Essential Functions of Configuration Management. Configuration management addresses itself to technical data associated with hardware/software. It is involved with ensuring the physical and functional characteristics of an end product are properly identified, controlled and recorded throughout its life cycle.

The principal functions of Configuration Management (CM) are as follows:

—*Configuration Identification.* For every end product, configuration identification is established in the form of technical documentation. Initially, a functional configuration identification is used to establish the performance-oriented requirements for full-scale development. At the end of the first program phase these requirements are translated into allocated configuration identification for selected items that are part of a higher level item. Finally, for developed items, product configuration identification is used to prescribe "build to" or form, fit and function requirements, and acceptance tests for verification of these requirements.

The configuration identification function ensures the systematic determination of all technical documentation (specifications, drawings and associated lists) needed to describe the physical and functional characteristics of items designed for configuration management. Further, it ensures these documents are current, approved and available for use by the time needed.

—*Configuration Control.* Configuration control is conducted on the basis of the configuration management level concerned and as appropriate to the phase of the life cycle involved. End product configurations are controlled by controlling changes to baseline technical documents and then ensuring the produced hardware/software matches the required physical and functional characteristics descriptions in these controlled documents. Technical and operations functions participate in establishment of all proposed baselines and consideration of changes thereto, throughout the life cycle of the end product.

Control of changes is the most visible aspect of configuration management because persons in this activity evaluate and approve or disapprove proposed engineering changes, as well as requests for deviation to, or waiver of, technical requirements. The purpose of change control is to prevent unnecessary or marginal changes while expediting the approval and implementation of those deemed worthwhile; i.e., those that are necessary or promise significant benefit to the customer. The customer is interested in changes that will:

—Correct deficiencies

—Significantly improve operational effectiveness or reduce logistic support requirements

—Result in substantial life-cycle cost saving

—Prevent slippage in an approved production schedule.

In addition to change decision-making, control of changes includes the equally important functions of (a) setting change priorities; i.e., emergency, urgent or routine, and (b) ensuring necessary instructions and funding authorizations are issued promptly for approved changes.

—*Configuration Status Accounting.* Configuration status accounting encompasses the recording and reporting of initial baselines, changes from these baselines, and the proposed affectivity and status of implementation of approved changes. Data records ensure the continuing visibility needed to manage configuration effectively. Recording may be automated when the volume of data or information retrieval response time required makes it economically feasible or desirable.

Configuration status accounting offers the means through which actions affecting the configuration of an end product are recorded and reported to program and functional managers concerned. The accounting function identifies the initial approved configuration of the end product; then, continuously tracks changes proposed to that configuration as well as the priority,

schedule and progress of approved changes. Additionally, current information is provided on all other aspects of a change to an end product; e.g., other hardware/software affected, operating and technical manual revisions, modification kits and spares requirements, specification and drawing updating.

—*Application and Tailoring of CM.* Configuration management requirements apply during the program life cycle of end products, whether they are part of a system or independent items. Contracts invoking configuration management specifically identify unique configuration management requirements. Normally, these unique requirements are based upon the scope of the program and the complexity of the item to be produced.

Configuration management, when properly applied, is a customer-contractor shared responsibility. Proper application enhances end product performance repeatability, minimizes design change effects, and reduces the incidence of end product incompatibility and unusable spare parts.

Configuration management requirements are extended to subcontractors and suppliers designing and/or fabricating items procured in support of contracts or programs on which this discipline is applicable.

When configuration management is applied to a subcontractor's or supplier's privately developed item, the constraints of rights in data need be recognized, as well as the inherent absence of the prime contractor's right to control the detailed configuration of such an item.

The application of configuration management must be carefully tailored to be consistent with the quantity, size, scope, stage of life cycle, nature and complexity of the end product involved.

—*Background.* Prior to 1962, management of systems and equipment characteristics (or configuration) was confined almost completely to controlling changes to production hardware by approval of engineering change proposals (ECPs). Careful technical and management attention usually was given only to major design and engineering changes because of their visibility and impact on technical performance, and on program cost and schedule. However, other important problems resulted from ECPs but were not given comparable attention because they were not so obvious, and because they did not impact quickly or directly on program objectives.

Early in 1964, the DOD conducted a study of engineering change control practices in several large programs. It found that ECPs accounted for 20 percent of the dollar growth and 80 percent of all change actions. The study concluded that increased program costs were caused by failure to consider all the factors in making change decisions, by lack of uniformity in DOD change practices, and by the fact that the procedures in use failed to ensure prompt change processing, decision-making and implementation of changes.

Some of the problems are indicated below:

The total cost and other consequences of ECPs were not known at the time of approval. Many ECPs and approvals evaluated only the change. Little assessment was made of the modification kits and other spares that would have to be procured and distributed (sometimes to many locations); whether test, support or training equipment would have to be modified; the extent of revision to operating and maintenance practices, workloads, manuals, etc. Because the "advantages" of the change were stressed and its side effects were not known or presented, changes of marginal value were often approved.

Proposed changes were not evaluated promptly. Other than changes to correct hazardous conditions, decisions on ECPs were frequently deferred. If a change was subsequently adopted, the delay caused larger retrofit programs, normally accompanied by higher costs.

Approved changes were not incorporated promptly. Once approved, changes to items in production were normally made within a reasonable time. However, changes to items in operational use frequently extended over long periods of time, thus denying the user of the item the benefit on which the change was based. Moreover, operation, maintenance and logistic support of the item were made more difficult because of the "mixed inventory" that resulted.

Responsibility and authority for managing configuration was diluted. Frequently, there was no single individual fully responsible and authorized to make and enforce decisions on item configuration. The prevalence of committee type action, requiring at least a consensus and sometimes unanimity, caused undesirable compromises and delays in configuration decisions. Additionally, it was difficult to retain the configuration commonality that made possible effective and economical production and cross-Service logistics support of items procured for use by more than one Service.

Specifications were inadequate for configuration needs. Guidance for the preparation of specifications was oriented to the procurement of standard production items, and thus was not adequate for the preparation of specifications to be used in the development and follow-on production of complex systems and major equipment. Methods were not provided for ensuring specifications to be used during development would be performance oriented; i.e., they would describe functional characteristics of items. Consequently, important functional characteristics often were omitted or not adequately described and quantified, while unnecessary design constraints; e.g., physical characteristics, were prematurely specified.

Verified technical documentation was lacking when needed. Policies and procedures in use did not ensure configuration technical documentation was accurate, or that it matched the item it described. Also, this data frequently was not available when needed for change-related design and manufacture operations, for quality assurance and acceptance inspection and, especially, for operational, maintenance and logistic support purposes.

The configuration of items in use was not known. Procedures were not effective for identifying the approved configuration of items, or for determining the status of changes that had been approved or accomplished. Thus, real knowledge of the configuration of items in use often was not available, making the maintenance and logistic support of the item difficult and more costly to perform. In some cases, the actual configuration of items, when deployed, mismatched with their operational interfaces, with serious effect on operational readiness.

Configuration practices caused misunderstandings and delays. There were incompatibilities among and within the military departments in the configuration areas of policy, technical documentation, item identification (numbering), terminology and ECP procedures. In addition to causing program misunderstandings and delays within DOD, this lack of uniformity was particularly burdensome for the large number of contractors doing business with more than one DOD customer.

Configuration-related problems were most evident in programs for the production and deployment of large, complex systems. This led the Air Force, in 1962, to establish for internal use the first comprehensive policy and procedural guidance on configuration management (AFSC Manual 375-1). In 1964, this manual was revised to incorporate the experience gained in its use, to improve control of item configuration during the development phase (since achieving approved item characteristics was the basis for program approval), and to provide exhibits for contractual application in development and production. Similar guidance on configuration management was issued by the Army in 1965 and by the Navy in 1967.

The concept and principles of configuration management were not new. Primarily, the DOD, with considerable help from industry, identified, assessed, improved and codified the logic and practice of configuration management, and integrated it with the system engineering management and logistics management processes over the entire life cycle of defense systems and equipment. Rational procedures and a discipline were developed for this purpose. The payoff was that these techniques improved the ability of the items involved to achieve the operational performance and readiness they needed at the lowest total cost.

Early in 1964, the Logistics Management Institute (LMI) reported on its study of engineering change control practices. In addition to the finding that ECPs accounted for 20 percent of the dollar growth and 80 percent of all change actions (on the several large programs analyzed), LMI concluded that increased program costs were caused by failure to consider all the factors in making change decisions, by lack of uniformity in DOD change practices, and by the procedures in use failing to ensure prompt change processing, decision and implementation.

Later in 1964, at the DOD Conference on Technical Data Management, the Panel on Configuration Control/Change Control Documentation concluded that configuration management was essential to the successful accomplishment of major DOD programs, and a large spectrum of development and production activities "depend heavily upon a clearly defined and strongly supported configuration management system."

In June 1964, the Assistant Secretary of Defense (I&L) and the Director of Defense Research and Engineering (DDR&E) jointly initiated a comprehensive effort to establish more effective techniques and to develop uniform policies, practices and contractual documents for use in managing system and equipment configuration throughout the life-cycle phases of development, production, operation and support. This OSD/DOD Component effort, which included regular collaboration with all segments of industry through the Defense Industry Advisory Council (DIAC) and the Council of Defense and Space Industry Associations (CODSIA), produced the policies and procedures necessary for effective configuration management. Many of these were adopted for use prior to formal issue of the policies. Emphasis was then placed on their implementation, and on establishing the needed indoctrination and training programs.

Data Management. The DOD Instruction 5010.12, "Management of Technical Data," carries a message – prepare only data that is needed and have it delivered when it is needed. But, there is a common complaint: the dollars involved are too high. Industry has suggested that their DOD customers want too much data (and too often in approval format). The DOD, in turn, contends that industry is not managing their data programs effectively. Both industry and DOD personnel, who are knowledgeable of this subject agree that if the objectives of the DOD Instruction are achieved – when it is applied to a specific program – the acquisition of data will be cost effective.

The DOD Instruction 5010.2 states:

> The objectives of the DoD Program for the management of technical data are to assure optimum effectiveness and economy in the support of systems and equipments within the Defense establishment. The management of these data is not an end in itself but is supportive in nature. The accurate determination of requirements, the orderly acquisition and timely utilization of adequate technical data shall be accomplished by:
>
> a. Planning data requirements concurrently with planning for systems, material and services, to insure coordinated planning.
>
> b. Procuring or preparing data on the basis of need for a specific intended use, and only when requirements can be economically justified.
>
> c. Selecting contract data requirements from a list of data that have been authorized for procurement, to minimize proliferation of data requirements.
>
> d. Including contract data requirements on a single form in all contracts, to provide for visibility and control.

e. Providing for the review and challenging of proposed contract data requirements by other than the requiring organizational element to assure objective evaluation of need.

f. Insuring that effective quality assurance programs and procedures are established to assure that contract data requirements are met.

g. Promoting optimum uniformity in DoD Component data requirements to avoid unnecessary cost of preparation and contract administration and to facilitate exchange of data among DoD components.

h. Deferring the ordering or delivery of data until the need and delivery dates can be clearly determined.

i. Insuring that Requests for Proposals (RFP's) include data requirements.

j. Promoting effective use of data in coordination with integrated logistic support, configuration management, system engineering and other similar systems.

Chapter 27

Concept Formulation and Contract Definition

In July 1965, OSD issued a directive requiring that concept formulation and contract definition phases precede the engineering development phase of each major program.[6] Concept formulation phase activities were to include accomplishment of comprehensive system studies and development of experimental hardware; contract definition (formerly referred to as the project definition phase in the previous issue of this directive[7]) was the period during which preliminary design and engineering were to be verified or accomplished, and firm contract and management planning were to be performed on a program. Before proceeding with the engineering development phase of a new program, the program had to be accepted as a part of the FYDP.

Chapter 28

Production Engineering

The capability to produce a hardware item satisfying mission objectives is as essential as the ability to define and design it properly. For this reason, production engineering analysis forms an integral part of the system engineering process. It includes producibility analyses, production engineering inputs to system effectiveness, trade-off studies, life-cycle cost analyses and consideration of the materials, tools, test equipment, facilities, personnel and procedures that support manufacturing in research, development, test and evaluation (RDT&E) and production. Critical producibility requirements are identified early and included in the program risk analysis. When production engineering requirements create a constraint on the design, they are included in applicable specifications. Long lead time items, material limitations, transition from development to production, special processes, and manufacturing constraints are evaluated and documented.

Manufacturing activities begin in the concept exploration phase when a system concept has been defined. Initial activities are concerned with production feasibility, costs and risks. As development proceeds, trade studies are conducted to establish the most cost-effective methods for manufacturing items, and detailed plans are developed for the production phase. During production, extensive controls are implemented at prime contractor and subcontractor facilities to ensure that the product will meet specifications.

During the early program phases, the contractor's production engineering personnel are integrated into the system engineering organization to ensure producibility requirements are incorporated into the appropriate specifications and plans. The production engineers review conceptual designs with engineering specialists, conduct manufacturing trade studies to establish the most producible design, and prepare the production plan.

During the full-scale development (FSD) phase, a manufacturing organization is established that reports to the program manager. The elements of production engineering, planning, facilities and equipment are integrated into this manufacturing organization. Product assurance, a separate organization (also reporting to the program manager), provides surveillance of manufacturing and subcontractor operations. Prototype and qualification articles are produced and tested to demonstrate that the system meets its specification requirements. Prior to the start of full production, a Production Readiness Review (PRR) is conducted to ensure all necessary resources and controls have been established.

During the early program phases, production engineers work with design engineers to define the impact on existing resources and provide data on manufacturing alternatives to proposed designs. As a baseline design becomes defined, specific criteria are established upon which the manufacturing process can proceed.

Manufacturing Trade Studies. Manufacturing trade studies, which include engineering design, reliability, maintainability, program schedules, life-cycle cost-effectiveness, producibility, supportability and other factors, impact overall program objectives. Trade studies are conducted to evaluate the most cost-effective manufacturing process to be employed within program constraints of schedule, risk and the like. The trade study process involves the identifying alternate candidates, defining evaluation criteria, weighing and scoring the candidates, and examining adverse consequences. Through analysis and data gathering, the characteristics of each approach are established. The candidates are scored, and the results are summarized.

Manufacturing Planning Support. The results of the production engineering analysis are documented in the production plan, which defines manufacturing concepts and methods. The plan provides sufficient information to supporting organizations to ensure a timely, coordinated approach to the production process. The plan is developed in preliminary form during the concept exploration and demonstration/validation phases. The final plan is completed prior to the PRR. During the FSD phase, as the detail design is completed and prototype hardware is developed, production engineering supports planning by continuing and refining its analyses to more detailed levels and by developing requirements for items not visible in earlier phases, such as shop aids or templates that could optimize production and assembly. After the baseline design is established, Engineering Change Proposals (ECPs) are evaluated by production engineering as part of the configuration management process to provide manufacturing inputs on cost and schedule impacts.

The PRR is conducted at the end of the FSD phase to establish that the system is ready for efficient and economical quantity production, adequate test planning has been accomplished, and problems encountered have been resolved.

Documentation. Much of the production engineering analysis is directed toward preparation of a production plan, which has the following content:

Manufacturing Organization. Provides organization charts and defines functional responsibilities.

Make or Buy. Defines division of effort between in-house and subcontractors, and justifies decision for selection. Provides cost estimates for items including start-up costs.

Subcontracting. Defines company policy, procedures and purchasing systems as they pertain to small business and labor-surplus-areas.

Resources and Manufacturing Capability. Defines facilities and equipment to be used, with plant layout and modernization, if any, proposed. Defines materials and components to be used or developed, together with manufacturing methods. Defines special tooling and test equipment required.

Production Planning. Defines schedules, lead times, phasing, production controls and assembly sequences.

A PRR report also is prepared at the conclusion of the review identifying team members and their specialties, summarizing their findings including potential problems, and providing conclusions and recommendations.

Chapter 29

Total Package Procurement

In the mid-1960s, successful development contracts were generally followed by production contracts with little or no likelihood that the developer would have to face competition. To ensure this, contracts based on the initial competitions started to include, along with the development effort, requirements for substantial production quantities. Observing this trend, Robert H. Charles, ASD (Installations and Logistics), conceived the total package procurement (TPP) concept. The objectives of this concept were as follows:

— Limit or eliminate "buy-in" considerations

— Motivate contractors to design for economical production, and minimize any tendency for production redesign

— Encourage subcontracts with, and obtain components from, the most efficient supply sources

— Encourage contractor efficiency through competition, and thereby reduce costs.

According to Charles, TPP would allow the government, like any buyer in the commercial world, "...to make a choice between competing products on the basis, not of estimates, but of binding commitments concerning performance and price of operational equipment."[8] It established these commitments competitively for as much of a program as practicable, and then permitted the winning contractor's profit ultimately to be determined under an incentive arrangement that related opportunity to risk. Profit was targeted initially in competition, and was finally determined by the quality of the product and the efficiency of the winning contractor.

The TPP concept fell far short of its goal. Cost overruns continued, new defense systems failed to meet technical performance requirements, and schedules slipped on many programs. The reasons for the failure of the TPP concept are many. The "heating-up" of the economy and the onset of inflationary pressure — both unrelated to a specific program — may have been partially responsible for the failure of the TPP concept. More importantly, the concept did not provide contractors with sufficient management flexibility to cope with all of the problems as they became known. Contractors had to make substantial production commitments to meet delivery schedules before completion of design and verification by testing. Costly redesign and rework followed. Continued trade-off analysis was stifled because of the rigidity of the contracts.

Although the Air Force Maverick air-to-surface missile program was successful using the TPP concept, serious problems were encountered on many other programs. Among those running into trouble were the Air Force Galaxy transport (C-5A) and short-range attack missile (SRAM); the Army Cheyenne helicopter (AH-56A); and the Navy destroyer (DD-963). As a result of the

problems encountered, DOD recognized the need to place stringent limitations on the application of TPP. Perhaps the most important limitation was ensuring that the estimates of future Service demands, military threats and technology were sufficiently accurate to allow pricing options on proposed defense acquisition programs to be evaluated adequately before program initiation.

Chapter 30

Plea for Disengagement

Early in 1965, industry made a plea for disengagement from a number of government-imposed management systems. Contractors, through the industry associations, voiced concern about the proliferation of management systems imposed on defense acquisition programs, and the growing number of reporting requirements. Industry deemed this trend to be inconsistent with fixed-price or incentive contracting. It questioned how the customer (government) could review and approve contractor actions without seriously weakening either the contract incentives or the warranties. Industry made the case that, when the customer chose to exercise detailed management of a program, the customer should share the success or failure of the contractor's performance with respect to incentives and fixed-price limits.

New tools had to be found that would provide the customer with "visibility," while not interfering with contractor prerogatives. The Aerospace Industries Association (AIA) formed a Systems Management Analysis Group (SMAG) to investigate the problem. Highlighted in the resulting report of this group, issued in May 1966, were the conflicts between existing DOD management systems; the need to match appropriate management systems with the type of contract selected for a given defense system program; and the need to tailor the degree of management to the complexity of the program involved. The report urged that steps be taken to ensure any new management system was worthwhile, in light of the expense involved in its application; consistent with those management systems already adopted for use by DOD; and in consonance with overall DOD policy.[9]

The force of the industry pleas led to the release of DOD Directive 7000.1 in August 1966, addressing resource management systems of the DOD.[10]

Chapter 31

Resource Management Systems

In September 1965, Dr. Robert N. Anthony of Harvard succeeded Hitch as ASD (Comptroller). Upon the appointment of Anthony, the SECDEF assigned to him the task of bringing an accountability feature into the PPBS and providing some government "disengagement." This was accomplished by development and implementation of resource management systems (RMS). The RMS minimize requirements for information while obtaining the data that are essential for program management purposes. Where possible, The RMS make use of contractors' internal systems and reporting procedures, thus avoiding the imposition on contractors of unnecessary reporting burdens.

The principal resource management systems were as follows:

- Programming and budgeting system — the process of establishing goals and determining the resources needed to reach the goals

- Managing the acquisition, use and disposition of capital assets

- Managing the acquisition and disposition of inventory and similar assets

- Managing the resources for operating activities; i.e. the combat forces and their associated support.

The resource management systems were not only oriented to the needs of management, but they provided information required by the Bureau of the Budget (now the Office of Management and Budget), the Treasury Department, and the Congress.

The ASD (Comptroller) became custodian of all resource management systems. Those systems related directly to financial control or reporting were made his direct responsibility; the other management systems were made subject to his approval. Additional DOD directives and instructions in the 7000-series, relating to management and control systems, were issued in the late 1960s and early 1970s.

Chapter 32

Selected Acquisitions Information and Management Systems

In 1965, Anthony recognized the need to develop an integrated approach to financial management for major defense systems acquisitions. The problems rampant at the time were proliferation of systems and reports, costs of operating the systems, lack of capability to make adequate cost estimates, lack of adequate contract status information, and lack of cost control.

Industry, through the representation of major industrial associations in the Council of Defense and Space Industry Associations (CODSIA), collaborated with DOD in the development of a selected acquisitions information and management system (SAIMS). The SAIMS – a subsystem of the resource management systems – was born in December 1965. This new system followed the approach of getting information from the contractors' management control systems in a form DOD managers could use to support planning and to evaluate contractor progress. The SAIMS, which continued to evolve over the next three years, provided both DOD and industry program management with economic impact analysis. Also, it provided information for estimating costs of new programs, follow-on procurement and major program changes, pricing and negotiating, funds management, and performance measurement. The relationship of SAIMS to RMS is illustrated in Figure 6.

During the defense systems acquisition process, the three kinds of financial information required by DOD management from industry were:

– Funding information for budget preparation and update

– Historical cost data for use in estimating costs on new defense systems programs, or extensions of existing programs

– Contract performance information to assess contract status, evaluate performance trends, and provide early visibility of cost and schedule problems.

All contractually related financial management reporting emanates from a contractor's internal system; therefore, it was necessary to ensure the contractor's system was sound and it provided reliable data. The criteria set forth in DOD Instruction 7000.2 were established as standards of acceptability.[11]

Application of cost/schedule control systems criteria (C/SCSC) on a defense system acquisition program provided the program manager with better visibility and controls for

achieving cost, schedule and performance objectives. Also, provided the government program manager with the following:

- A means for recognizing previously unidentified problems on the program
- An ability to trace the problems to their source
- A method for determining the cost impact that would be created by the problems
- An objective, as opposed to subjective, assessment of program status on a periodic basis.

From the contractor's viewpoint there were two benefits to be gained from application of a cost/schedule control system to a program: (1) an improved overall system discipline, and (2) a more detailed planning and budgeting process.

Chapter 33

Selected Acquisition Reporting System

In 1967, a system involving the preparation and presentation of reports on selected defense systems programs was conceived by Anthony. The objective of this internal DOD reporting system — released as DOD 7000.3 early in 1968 — was to summarize technical performance, schedule, and cost information on "selected" major defense system programs.[12] Submitted quarterly, each selected acquisition report (SAR) provided SECDEF with program visibility and progress, and identified specific problems relating to meeting designated performance, schedule and cost targets. Management attention was focused primarily on exceptions to the program plan and breaches of program thresholds established in the development concept paper (DCP), later known as the decision coordinating paper. The SAR system closed the feedback loop on major defense system programs by comparing actual with planned accomplishments.

In April 1969, the SAR became the vehicle for providing the Congress with the status of major defense system programs. Then, in 1975, through passage of Public Law 94-106, the SAR became the legal document for providing standard, comprehensive summaries of the status of selected defense system programs to the Congress at the end of each quarter of the fiscal year.

Chapter 34

Should-Cost Analysis and Pricing

In the late 1960s, defense officials began to express their concern about the adequacy of the pricing techniques used in sole-source procurements. They recognized that when there were no competitive forces at work, there was a tendency for contractors to be liberal in their cost estimates. This tendency appeared to be especially prevalent when costs were being estimated beyond one year. Defense officials reached general agreement that contract prices must reflect economical and efficient performance practices, as well as realistic costs. To bring this about, government contract negotiators had to learn how to recognize a realistic contract price — a figure based upon what the program should cost when the contractor was performing with reasonable economy and efficiency.

To meet the problem head-on, Anthony sponsored the development of a new pricing technique. This technique, identified as a "should-cost analysis," consisted of an in-depth analysis of a contractor's management, cost-estimating and production practices. In addition, the effects of poor performance were identified and measured using standard industrial engineering techniques. The findings were used to develop a baseline for pricing. The price excluded the costs resulting from inefficient practices. The should-cost analysis and pricing technique, based on the coordinated efforts of a team of government engineering, pricing, procurement, auditor and management specialists, proved to be effective in fostering long-range improvements in industrial practices and in setting more realistic contract prices.

Chapter 35

Some Major DOD Directives and Lessons Learned

In the middle to late 1960s, several major policies/directives were issued by DOD that relate to the defense acquisition process. Although they will not be discussed in detail, the subjects covered are worthy of note:

—Development of integrated logistic support plans for systems/equipment; i.e. the integration of logistics considerations and logistics planning into the systems engineering and design process

—Proposal evaluation and source selection

—Defense standardization program; i.e., a program to control item proliferation

—Quality assurance (QA); i.e., the enforcement of technical criteria and requirements governing all material, data, supplies and services developed, procured, produced, stored, operated, maintained, overhauled or disposed of by or for DOD

—Selection and application of management control systems in the acquisition process

—Value engineering (VE) program; i.e., a program to eliminate or modify unessential characteristics and minimize cost through the organized use of value engineering

—Technical data management; i.e., the standard way of doing business when contractor-prepared data are required by functional managers in various functional areas. Data requirements result from, and are subservient to, related tasks in the statement of work.

During the 1960s, several lessons were learned beyond those cited, namely:

—The acquisition process lacks timeliness and flexibility in responding to world threats.

—Paper studies cannot adequately establish that the technology needed for a new defense system is at hand. Breadboards, brassboards or other hardware demonstrations of feasibility reduce the margin for error. When resources are scarce, hardware demonstrations may have to be limited.

—Trade-offs between performance, cost and schedule, with the objective of achieving the right balance between performance and cost, should be made prior to the engineering development phase of a program life cycle.

– Planning for integrated logistic support (ILS) – the composite of all the support considerations necessary to ensure the effective and economical support of a defense system throughout its life cycle – should begin prior to the engineering development phase.

– The period in which design takes place is not the right one for discovering and implementing untried technology; rather, it is the time for integrating known technology.

– Specifications requirements should be simplified and limited throughout the acquisition process, and use of applicable existing industrial standards, specifications and hardware should be increased to minimize costs.

– Independent parametric or comparative pricing techniques should be used to achieve more realistic costing.

– Both parties to a contract should have a reasonable time to examine the technical package and discuss it before any commitments are made.

– There is no substitute for competent and objective surveillance of critical program elements on a continuing basis.

Chapter 36

International Environment in the Sixties

In the early 1960s, the U.S. foreign policy, *vis-a-vis* Europe, shifted from military aid to military trade. As the decade advanced, European countries became more self-reliant as their prosperity increased. Europe redeveloped a portion of its technology base, located and developed markets in the Third World, and began to compete with the United States in specific facets of the defense business.

The growth of European defense industry created a number of problems – military, economic and political.

– Militarily, the growth of European industry led to destandardization, which resulted in some major problems. For example, when U.S.-built systems and equipment were replaced with European-built systems and/or equipment, logistical problems developed.

– Economically, the growth of European industry – in a collective sense – enabled our allies to compete with the United States in Third World markets.

– Politically, as European defense industrial bases become institutionalized, nationally and transnationally, the United States began to feel the challenge of its allies.

When foreign customers procure major defense systems still in development or production, fixed (nonrecurring) costs can be spread over a large base, thus reducing U.S. unit costs and the total costs of ownership. However, several less obvious factors, such as the creation of a need for excessive overtime when U.S. negotiators settled for over-ambitious delivery schedules, impacted U.S. programs.

Chapter 37

Recommendation for Legislative Action

In the late 1960s, industry believed major changes were needed in the Armed Services Procurement Act of 1947 and the Armed Services Procurement Regulation (ASPR). It was the prevailing viewpoint in industry that the attention and emphasis needed to improve the process could be achieved only through congressional hearings, followed by appropriate legislation. John P. Elliot of the Western Electronic Manufacturers Association – now the American Electronic Association (AEA) – in an appearance before Representative Chet Holifield's Military Operations Subcommittee of the House Committee on Government Operations in June 1969, called for establishment of a commission on government procurement.

Appearing before the same subcommittee of the House of Representatives shortly thereafter, Karl G. Harr, then president of the Aerospace Industries Association, urged support of the proposed bill to establish a commission on government procurement. During his appearance, Harr place the relationship of government to industry in perspective. He said:

> ...in the government-industry interface there are fundamental differences in emphasis. The system requires that this be so. Two basic principles underlie that interface. Both sides subscribe to both of these principles but each side of the interface bears a different primary mandate. The government procuring agency has as its primary responsibility the acquisition, in the most efficient manner, of the best possible goods and services in support of national programs. Industry supports this principle. Industry on the other hand bears the primary mandate of doing the best job of which it is capable, again in the most efficient manner. The government subscribes to this principle.
>
> Despite the apparent compatibility of these two points of view...these principles are *not* necessarily...wholly reconcilable in the tens of thousands of applications which today's large government/industry interface requires....Threading one's way through today's complicated and complex procurement environment in such a way as will at all times preserve our basic principles and objectives in optimum fashion, and give full vent to the collateral factors which must be considered, is about as sophisticated a challenge as any among us has to face.[13]

Congress was receptive to the industry recommendation and a commission was created in November 1969. The commission was given a charter to study the government procurement policies and practices and to recommend to the Congress any changes to them that would promote efficiency, economy and effectiveness in the procurement process. The findings and recommendations of the commission presented to the Congress in 1972 are discussed in the next chapter.

Part Four Information Sources

1. Charles J. Hitch developed the PPBS at the Rand Corporation in the early 1960s on an Air Force sponsored study.

2. U.S. Department of Defense Directive 4100.35, "Development of Integrated Logistic Support for Systems and Equipment," 19 June 1965.

3. U.S. Department of Defense Directive 5000.1, "Acquisition of Major Defense Systems," 13 July 1971.

4. U.S. Department of Defense Directive 4105.62, "Proposal Evaluation and Source Selection," 6 April 1965.

5. U.S. Department of Defense Directive 5000.28, "Design to Cost," 23 May 1975.

6. U.S. Department of Defense Directive 3200.9, "Initiation of Engineering and Operational Systems Development," 1 July 1965.

7. U.S. Department of Defense Directive 3200.9, "Project Definition Phase," 26 February 1964.

8. Robert H. Charles presentation before the Defense Industry Advisory Council on "Total Package Procurement Concept," 18 February 1966.

9. Report of the Systems Management Analysis Group, Aerospace Industries Association of America, 12 May 1966.

10. U.S. Department of Defense Directive 7000.1, "Resource Management Systems of the Department of Defense," 22 August 1966.

11. U.S. Department of Defense 7000.2, "Performance Measurement for Selected Acquisitions," 22 December 1967.

12. U.S. Department of Defense Instruction 7000.3, "Selected Acquisition Report (SAR)," 28 February 1968.

13. U.S. Congress, House, Government Procurement and Contracting, pt. 9, p. 2488, 1969.

PART FIVE

THE TRANSITION FROM THE SIXTIES TO THE SEVENTIES

In 1969, the Congress displayed some preoccupation with the economy, the environment and energy. This preoccupation, along with the growing sentiment to fund social programs, disenchantment with the conflict in Vietnam, and escalating costs of defense systems programs, led the Congress to make the defense effort the primary target for budget cuts.

To respond to this situation, Secretary of Defense Melvin R. Laird and Deputy Secretary of Defense David Packard initiated a number of actions aimed at improving the management of the defense systems acquisition process and gaining control of systems acquisition costs.

Chapter 38

Creation of the Defense Systems Acquisition Review Council

In May 1969, Packard established by memorandum a Defense Systems Acquisition Review Council (DSARC) within the OSD.[1] The DSARC was charged with evaluating major defense systems programs at certain points (milestones) and advising him on the status and readiness of each major defense system to proceed to the next program phase. The DSARC functions were to be separate from and not a part of the management reviews assigned to the Director of Defense Research and Engineering (DDR&E). The DSARC reviews were held prior to the start of each major phase to permit coordinated evaluation and deliberation among senior managers to ensure the advice given the SECDEF was as complete and objective as possible prior to a decision to proceed to the next phase in the system's life cycle. The DSARC functions were to be separate from, and not a part of, the management reviews assigned to the DDR&E. The DSARC reviews were made to permit coordinated evaluations and deliberations among senior managers prior to a decision to proceed to the next phase in the acquisition program.

When Packard issued his original memorandum, he emphasized that the primary responsibility for defense systems acquisition and its management on a particular program must rest with the cognizant Service and the program manager (PM) it designates. The PM should serve as the focal point within the Service. Packard wanted to ensure that each major program progressed through its life cycle according to a plan — an acquisition strategy. To do so, he created the DSARC to review major programs at significant milestone points; namely, prior to the start of the contract definition phases (now the demonstration and validation phase), prior to the engineering development phase (now the full-scale development phase), and prior to the production phase. The DSARC was assigned the task of evaluating each program with regard to issues, thresholds, and matters covered in the Development Concept Paper. At the outset, the DSARC was chaired by the Director of Defense Research and Engineering, Dr. John S. Foster, Jr.,[2] with the ASD (Installations and Logistics), ASD (Comptroller), and ASD (Systems Analysis) serving as principals. The Council coordinated the milestone reviews, documented the findings, and made its recommendations to the Secretary of Defense through the chairman. In addition to the principals, the concerned component head was invited to participate in the first DSARC (milestone) review. Component head participation in later reviews was not required, but the head could be invited to participate at the discretion of the chairman.

Chapter 39

Process Improvement

In addition to the DSARC actions, Packard requested in 1969 that the DDR&E conduct a management review at least once during each major acquisition program. Such reviews would prove helpful in determining what OSD actions might be taken to improve management of the defense systems acquisition process.

About the same time, Packard took a number of other important steps. He requested that increased dependence be placed on hardware competition — using prototypes — and demonstration, and that decreased dependence be placed on paper competition. Critics of this process claimed that it added substantially to development time and, as a consequence, to cost. Advocates said costs should be examined over the entire life cycle of a defense system and the system would benefit from the early discovery of problems or defects. Prototyping appears to be most advantageous when a defense system: (1) entails substantial innovation, (2) is to be produced in quantity, and (3) is characterized by a low ratio of development to total acquisition costs.

Relative to test and evaluation (T&E), Packard requested it begin as early as possible and be conducted throughout the acquisition process to assess and reduce risks and to estimate the operational effectiveness and suitability of the system being developed. Before the start of testing, issues critical to the system mission, test objectives, and evaluation criteria were to be determined. Successful accomplishment of the T&E objectives were to be the criteria for approving the commitment of significant additional resources to the program, or for advancing the program to the next phase in its life cycle.

Chapter 40

Origin of the "5000 Series"

In July 1969, and again in May 1970, Packard issued additional memorandums stating his concern about the defense systems acquisition process. The 1969 memorandum requested help from the Services in his search for ways to improve the process.[3] The 1970 memorandum provided policy guidance for acquiring major defense systems.[4] The Services were encouraged to tailor their acquisition practices to the peculiarities of each program. This memorandum, which included discussions of such things as management practices, program phases, contract types, and integrated logistics support, became the foundation for DOD Directive 5000.1, subject: "Acquisition of Major Defense Systems," issued in July 1971.[5] The memorandum and directive stated Packard's idea that "successful development, production, and deployment of a major defense system is primarily dependent upon competent people, rational priorities, and clearly defined responsibilities." Decentralization — which still did not exist — of responsibility and authority for the acquisition of major defense systems was to be fostered to the greatest extent possible, consistent with the urgency and importance of the particular program. Program managers were to be given adequate authority to make major decisions, rewards for good work, and more recognition toward career advancement. The OSD was to assume responsibility for establishment of acquisition policy and ensure the major programs were being pursued in response to specific needs. The military departments were to be given responsibility for identifying needs and defining, developing and producing systems to satisfy these needs. The OSD and the military departments were to be given joint responsibility for monitoring the progress of each major program. The Defense Systems Acquisition Review Council, established previously, was formally recognized as the group that would support SECDEF decision-making at each program milestone.

Under Packard, OSD disengaged from the detailed direction of the defense system acquisition process and assumed the role of monitor and decision-maker at milestones associated with major systems only. The monitoring process required that a "contract" be established between OSD and the procuring military department. The contract was the development concept paper — the DCP — and it was administered by the DDR&E. The DCP described the technical requirements to be achieved; the thresholds which, if needed, would be the basis for a review of the entire program; the quantity; the cost; and the schedule. At each program decision point, the program was to be reviewed by the DSARC. If the DSARC determined that the program was ready to advance to the next program phase, such a recommendation was made to the SECDEF, who had the decision authority. The SECDEF decisions at Milestones I, II and III were reflected in the DCP and incorporated in the FYDP documentation at the next program objectives memorandum (POM) submission.

The DCP became known as a decision coordinating paper in 1971. Through the years, its usage changed. Limited to 10 pages, it provided program information essential to the decision-making process. It contained a statement of the direction needed from the SECDEF, a description

of the overall program, the need for the program, the design alternatives, the acquisition strategy and program schedule, and the issues affecting the SECDEF's milestone decision. The DCP annexes included program goals and thresholds, resources required, and projected life-cycle costs.

Before the close of the 1970s, the SECDEF Decision Memorandum (SDDM), rather than the DCP, began to serve as the "contract" between OSD and the procuring Service. The SDDM recorded the SECDEF decisions and directions following receipt of DSARC recommendations, breaches of program thresholds, PPBS changes that affected program execution, and congressional actions that affected program execution.

The integrated program summary (IPS) – a document developed in the late 1970 – included, like the SDDM, some of the information formerly presented as part of the DCP. This 60-page (or less) document summarized the acquisition plan to allow informed analysis by interested OSD staff members. The mandatory annexes included a cost track summary, a funding profile, a summary of system acquisition costs, manpower requirements, and logistics data.

In 1975, DOD Instruction 5000.2[6] was issued to provide the procedure for complying with the policy contained in DOD Directive 5000.1. Also, about the same time, DOD Directive 5000.26 was issued to provide a charter for the DSARC.[7] The DSARC was described as a forum for open discussion of issues and alternatives on each major program by DOD officials. Two members were added to the DSARC as principals for programs within their areas of responsibility: ASD (Intelligence) and the Director of Telecommunications and Command and Control Systems (DTACCS). The DODI 5000.2 expanded Packard's original DSARC concept by adding more functions to its charter. The DCP became the focal point for the DSARC review. The DSARC meeting associated with a specific program milestone complemented the PPBS. Events leading to the DSARC meeting were defined with applicable time limits. Primary administrative responsibility for the DCP was given to the DSARC chairman's staff. Furthermore, the DSARC was given responsibility for review of program objectives memorandums. In December 1975, DODD 5000.1 was reissued, increasing the dollar amounts (based on 1972 dollars) used in defining a defense system as "major."[8]

The subject "DSARC" will be revisited later in the book.

Defense Systems Acquisition Education

To provide professional education in program management and defense system acquisition management, Deputy Secretary of Defense David Packard established the Defense Systems Management School. The immediate origins of the School can be traced to 1969 when Deputy Secretary Packard formed a review group to study all aspects of existing acquisition management education. Deputy Secretary Packard believed that successful acquisition programs were based on "participatory management," and that acquisition management education should, therefore, place less emphasis on procedures and more on people.

The primary focus of the review group's study was the Defense Weapon Systems Management Center (DWSMC), which was established at Wright-Patterson Air Force Base, Ohio, in 1964. This was the only DOD educational institution dedicated to training managers for defense acquisition programs. Among other things, the review group determined the Center's geographic location made it difficult for defense policy-makers in Washington to participate actively in the educational program, a serious deficiency in the view of the Deputy Secretary. The group, therefore, recommended that the school be moved closer to the Washington, D.C, area. In September 1970, Deputy Secretary Packard accepted the group's recommendations, including the one to relocate the school. This led directly to the establishment, on July 1, 1971, of the Defense Systems Management School (DSMS) at Fort Belvoir, Va.

The School was given three missions:

—To prepare selected military officers and civilian personnel for assignments in program management career fields

—To conduct research and special studies in program management and defense systems acquisition management

—To assemble and disseminate information relative to program management and defense systems acquisition management.

The DSMS gained in stature in 1974 when Deputy Secretary of Defense William P. Clements, Jr., issued a directive covering career development of DOD acquisition management personnel. This directive suggested that all program manager candidates attend the School either before or shortly after being assigned to a major program office. In 1976, Deputy Secretary Clements directed the School be redesignated the Defense Systems Management College (DSMC), in recognition of the true scope and sophistication of the curricula, and to reflect in a better way the level of professional education offered by the institution.

On August 22, 1988, the Honorable William H. Taft IV, then Deputy Secretary of Defense, signed DOD Directive 5160.55, "Defense Systems Management College," which expanded the mission of DSMC to include the entirety of acquisition management. The scope and magnitude of this new mission represented the greatest challenge to DSMC since its founding. Until then, DSMC, as the Defense Department's premier joint acquisition management college, had generally focused efforts on education, research and dissemination of information relating to program management and defense systems acquisition. Thus, the DSMC had to broaden its horizons to maintain excellence in education and training in all essential elements of defense acquisition management.

College Emblem

The first course offered by the College was the 20-week Program Management Course (PMC), which is still the nucleus of the academic program. The second course to be added to the

curricula was the Executive Refresher Course in Acquisition Management, offered for the first time on a quarterly basis beginning in February 1972. Also, in 1972 the Contractor Performance Measurement Course was added, followed in 1973 by the Systems Acquisition Management for General/Flag Officers seminar. Since 1973, more short courses have been added to the academic program, bringing the total to 23 short courses in 1991.

Since the College opened in 1971, more than 45,000 military and civilian personnel from all the Services and other federal agencies, as well as middle managers from the defense industry, have completed one or more courses at the DSMC.

Through the continuing support of the Office of the Secretary of Defense and the advice and consultation provided by the DSMC Policy Guidance Council and the DSMC Board of Visitors, the College seemed destined to play an increasingly greater role in preparing managers for active and productive roles in tomorrow's world.

Chapter 41

Concurrency vs. Nonconcurrency

The concept of concurrency, which had evolved in the late 1950s on the Air Force Ballistic Missile Program, involved the initiation of some of the production activities on a program prior to completion of the full-scale development effort. During the 1960s, the concurrency approach was used on major systems acquisition programs, commensurate with the risk.

In 1969, Packard requested a review of many defense system acquisition programs and discovered that the programs in trouble at that time were using the concept of concurrency. A detailed study of the use of the concurrency concept on successful programs was not made. As a result of Packard's discovery, a blue ribbon defense panel report in 1970, and a RAND report completed in the spring of 1971, Packard cautioned against unnecessary overlapping of program phases (concurrency) on future systems acquisition programs.

In the late 1970s, a Defense Science Board (DSB) study concluded that cancellation of some of the programs in the late 1960s could not be attributed to the application of the concurrency concept. In many cases, the programs had been cancelled for political or technical reasons, or because of a change in threat. Further, the DSB found that (1) an early production commitment did not necessarily cause a program schedule to slip, even though a development problem had to be corrected, (2) the addition of more formalized test and evaluation procedures during the 1970s ensured earlier discovery and correction of development programs problems, and (3) concurrency had been a normal practice in commercial business for many years. Therefore, the DSB took the position that overlap of program phases was desirable, provided a competent program manager was available to make it work, and the risks involved were not too large.

Chapter 42

Cost Growth

During the late 1960s and early 1970s, the Congress became increasingly concerned about (1) the cost growth on major design programs and (2) the tendency of DOD to become "locked into" development and production of major systems regardless of any increase in cost.

Packard recognized the need for an independent cost analysis group at the OSD level in 1969; however, such a group was not formally established until January 1972 when the SECDEF issued a memorandum establishing an OSD Cost Analysis Improvement Group (CAIG).[9] The group was given a charter to provide the DSARC with an independent evaluation of the cost of each major defense system program and to establish uniform criteria, standards and procedures for use by all DOD units making cost estimates.

In DOD Directive 5000.4, which provided a permanent charter, the CAIG became "an advisory body to the DSARC on matters related to (program) cost" and the focal point for cost analysis activities involving OSD staffs and all DOD components. Other duties of the CAIG included: (1) providing policy for the collection, storage and exchange of information on improved cost estimating procedures, estimating methods, and historical cost data, and (2) revising existing or developing new techniques for projecting costs.[10]

Chapter 43

Total Package Procurement Discontinued

Use of the total package procurement concept was discontinued by Packard. He believed contracts should be tailored to the risks involved. Cost-plus-incentive-fee contracts were preferred for advanced and full-scale development of major defense systems. When technical risks permitted, such contracts were to include provisions for competitive fixed-price subcontracts for subsystems, components and materials. This enabled major portions of a program to benefit from competition When risks were reduced to such an extent that realistic pricing could take place, fixed-price contracts were to be used. Packard requested consideration be given to the use of negotiated fixed-price contracts after the production design could be specified realistically. To the extent possible, contracts negotiated under these circumstances were to encourage competition for subsystems, components and materials.

Part Five Information Sources

1. David Packard memorandum to the Secretaries of the military departments, Director of Defense Research and Engineering, Assistant Secretaries of Defense, "Establishment of a Defense Systems Acquisition Review Council," May 30, 1969.

2. Later, Under Secretary of Defense, Research and Engineering (USDRE).

3. Deputy Secretary of Defense Memorandum, "Improvement in Weapon Systems Acquisition," July 31, 1969.

4. Deputy Secretary of Defense Memorandum, "Policy Guidance on Major Weapon System Acquisitions," May 28, 1970.

5. U.S. Department of Defense Directive 5000.1, "Acquisition of Major Defense Systems," July 13, 1971.

6. U.S. Department of Defense Instruction 5000.2, "Decision Coordinating Paper (DCP) and the Defense Systems Acquisition Review Council (DSARC)," January 21, 1975.

7. U.S. Department of Defense Directive 5000.26, "Defense System Acquisition Review Council (DSARC)," January 21, 1975.

8. U.S. Department of Defense Directive 5000.1, "Acquisition of Major Defense Systems," December 22, 1975.

9. Melvin R. Laird, memorandum to the Secretaries of the military departments, "Cost Estimating for Major Defense Systems," January 25, 1972.

10. U.S. Department of Defense Directive 5000.4, "OSD Cost Analysis Improvement Group," June 13, 1973.

PART SIX

DECADE OF THE SEVENTIES

Since the issuance of the basic DOD Directive 5000.1, focusing on the acquisition of major systems, several DOD policy issuances elaborating upon, or augmenting, the original policy were forthcoming in the 1970s. This chapter does not describe each of the policy documents in detail. However, many of the documents are worthy of mention before identifying the principal events surrounding those this chapter addresses.

Chapter 44

Policy Documents Deserving Mention

The policy documents worthy of mention, but not discussed here, are:

—*Defense Acquisition Regulation* (formerly the Armed Services Procurement Regulation)

—*Administration — General.* DODD 5000.23 Systems Acquisition Management Careers, November 1974; DODD 5000.29 Management of Computer Resources in Major Defense Systems, April 1976; DODD 5160.55 Defense Systems Management College, January 1977

—*Technical Management.* DODD 4120.3 Defense Standardization and Specification Program, February 1979; DODD 4120.21 Specifications and Standards Application, April 1977; DODD 4151.1 Use of Contractor and Government Resources for Maintenance of Material, June 1970; DODD 4151.9 Technical Manual Management, January 1975; DODD 5010.19 Configuration Management (supporting DODI 5010.21 was cancelled), May 1979; DODI 5000.36 System Safety Engineering and Management, November 1978; DODI 5000.37 Acquisition and Distribution of Commercial Products, September 1978

—*Integrated Logistics.* DODD 4100.35 Development of Integrated Logistic Support for Systems/Equipment (replaced by DODD 5000.39 January 1980), October 1970; DODD 4140.40 Basic Objectives and Policies on Provisioning of End-Items of Material, February 1973

—*Production, Quality Assurance, Test and Evaluation.* DODD 4155.1 Quality Program, August 1978; DODD 5000.3 Test and Evaluation, December 1979; DODD 5000.34 Defense Production Management, October 1977; DODD 5000.38 Production Readiness Reviews, January 1979

—*Resource Management.* DODI 7000.2 Performance Measurement for Selected Acquisitions, June 1977; DODI 7000.3 Selected Acquisition Reports, April 1979

—*Contract Management.* DODD 5010.8 DOD Value Engineering Program, May 1976

—*Information/Data Management.* DODD 5000.19 Policies for the Management and Control of Information Requirements, March 1976; DODI 5000.32 DOD Acquisition Management Systems and Data Requirements Control Program, March 1977

—*International Cooperation.* DODD 2000.9 International Coproduction Projects and Agreements Between the U.S. and Other Countries or International Organizations, January 1974, DODD 5530.3 International Agreements, December 1979.

Chapter 45

Commission on Government Procurement Report

In December 1972, the Commission on Government Procurement, chaired by E. Perkins McGuire, a consultant and corporation director, and cochaired by Representative Chet Holifield from California, presented its report to Congress.[1] The Commission – the first ever to concentrate exclusively on procurement – made 149 recommendations. Eighty-two recommendations required executive branch action and 67 required legislative action.

Among the principal findings of the Commission were the following:

– Government procurement policies and procedures were needlessly diverse.

– Congress was ill-equipped to evaluate performance, costs, and schedules for new defense systems programs in the context of national security objectives and priorities.

– Contractors were frequently bewildered by a variety of requirements from different government agencies, but lacked an effective branch through which to appeal for more realistic treatment.

– There was no systematic government-wide effort for studying ways to improve the procurement process.

Relative to the systems acquisition process, the Commission found that "the kind of data used to choose a preferred system (from available alternatives), the timing of the choice, and the subsequent design latitude have a predictable effect on the outcome of a major system program". The Commission also found a need to realign "...the acquisition structure to correct the *de facto* abdication of responsibilities in government and industry that has come about for want of a clear understanding of the decisions and actions that actually control system acquisition programs.

The Commission findings led to a major recommendation that an office of federal procurement policy be organized in the executive branch to formulate government-wide acquisition policies and regulations, and to monitor government-agency acquisition practices. Such an office was formed. The Commission also recommended the acquisition workforce be upgraded by establishing an institution that could provide necessary education and services. This was accomplished by the formation of the Federal Acquisition Institute (FAI) under Public Law 93-400.

Among the Commission recommendations directly applicable to the major systems acquisition process were the following:

– Emphasize competition on alternative systems approaches at the "front-end" of the acquisition process in order to minimize the occurrence of performance and cost problems downstream.

– Increase competition for major system acquisition contract awards by encouraging small- and medium-sized companies to propose alternate design concepts, provided they have contingency plans for the purchase or lease of production facilities in the event they win the competitions.

– Simplify the decision-making process, but keeping it flexible, and place greater reliance on sound judgment and less on regulations and complicated contracts and clauses.

– Develop legal and administrative remedies to speed resolution of contract disputes.

– Reduce management and administrative layering between policy-makers and program offices.

– Require more government reliance on the private sector, rather than in-house facilities, for procurement.

– Study means to increase awareness of costs associated with implementing social and economic goals through procurement.

– Give visibility to the Congress to exercise its responsibilities; i.e., provide congressmen with the information needed to make key program decisions and commitments.

The general industry reaction to the report was favorable. One industry spokesman said increased competition was the most innovative portion of the Commission's four-volume report. Other industry spokesmen felt that implementing the recommendations would result in greater competition for new programs, because of the early competition and the entrance of small companies into the market. The spokesmen felt that implementation of the recommendations would result in less red tape for government contractors, who were being confronted with a maze of procurement regulations.

Pentagon officials took the attitude that DOD was already moving in the direction recommended in the Commission's report. The actions initiated by David Packard two years earlier, and now being refined by new Deputy Secretary of Defense William P. Clements, Jr., were consistent with the Commission's recommendations. However, DOD did initiate a change to the defense systems acquisition process. The change required that a greater search be made for alternative concepts at the "front-end" of the process. By placing greater emphasis on the front end, the costs in the out phases would be reduced. However, the question that always must be answered on each program is, "How many competing concepts can be funded without having front-end costs get out of line?"

Controversy arose in government circles over the proposal to limit in-house government procurement and in industry circles over the use of government purchasing programs to further social and economic goals.

The report of the Commission, while it attracted very little public attention, placed a sharp focus on the procurement process and brought about some needed reforms. Some Commission recommendations were implemented quickly; others took longer to implement; and some may never be acted on either by the Congress or the departments within the executive branch.

Chapter 46

Life-Cycle Cost and Design-to-Cost

In the early 1970s, life-cycle cost (LCC) and design-to-cost (DTC) played important roles in DOD strategy to improve the defense systems acquisition process — a process that must succeed if the United States was to continue to have a credible defense at an affordable cost.

In 1973, DOD adapted the DTC concept to the systems acquisition process. This concept, used by companies in the commercial business field for many years, involved the establishment of a specific cost figure (in constant dollars for a specified number of systems at a defined rate of production) early in the system life cycle — before entry into the full-scale engineering development phase of a program.

In the initial issue of DOD Directive 5000.1, it was stated that "discrete cost elements (i.e., unit production costs, operating and support costs) shall be translated into design to requirements. System development shall be continuously evaluated against these requirements with the same rigor as that applied to technical requirements. Practical trade-offs shall be made between system capability, cost and schedule. Traceability of estimates and costing factors, including those for economic escalation, shall be maintained." The DTC concept recognized that the best system design is a function of need, performance, LCC and the number of defense systems required to meet the threat. It does not compromise system performance (capability) to meet cost objectives.

The AIA concluded in 1973 that the DTC concept would not have an impact on defense business unless some positive action were taken by DOD to ensure its effective implementation. Shortly thereafter, AIA began working with the OSD staff to develop a sound DTC policy, and with the Joint Logistics Commanders to develop effective implementing procedures. The directive published in 1975 — DOD Directive 5000.28 — was favorably received by industry. To comply with this directive, the military departments had to revise their joint guide to make it more compatible with the policy contained in the directive. This revision was accomplished, and industry found most practices set forth in the revised guide to be acceptable.

In the ensuing years, application of the DTC concept proved to be helpful on many programs by reversing the trend toward high unit production costs.

The DOD discovered that the DTC principles were critical to controlling LCC. The initial DTC goal should be decided in the conceptual period of a program, because cost is a feasibility issue. When there is a problem of buying sufficient defense systems to counter a potential enemy threat, high-cost solutions are not affordable.

Up to 3 percent of the LCC can be consumed in demonstration and validation, 12 percent in full-scale development, 35 percent in production, and up to 50 percent in operation and

support. Therefore, dollars spent prior to production to lower either production costs or operation and support costs can result in a significant return on investment. Cost distribution on a specific defense system may vary considerably from these percentages. The cost of the demonstration and validation phase usually tends to be significantly understated because contractors may finance up to 50 percent of the effort.

A review of the applications of LCC – initiated in November 1974 and completed in April 1976 – was conducted by a NSIA *ad hoc* committee at the request of the ASD (Installations and Logistics). This review on the subject of LCC established a dialogue between DOD and defense industry and a better understanding of LCC.[2]

Chapter 47

Joint-Service Programs

Joint-Service acquisition programs were strongly supported and generally encouraged by OSD and the Congress. In 1973, the Joint Logistics Commanders issued a memorandum of agreement (MOA) setting forth principles of joint program management.[3] The MOA introduced the concept of an executive (or lead) Service and participating Services and established the general authority and responsibilities of the Services on a joint program. The MOA also addressed multi-Service program charters, program master plans, and joint operating procedures to be used in joint program management. To implement the concept, the MOA was promulgated as a joint regulation. A joint program is generally structured so as to ensure accomplishment of specific goals. The importance of the program, as well as its size and urgency, affects the organizational structure and the way the program business is conducted.

Most of the policy and procedural guidance during the 1970s was developed by the cooperative effort of the Services; however, the Service-wide procedure for joint-program contracting was documented in the Defense Acquisition Regulatory System (DARS).

The JLC sponsored in the late 1970s the development of a guide to assist the people involved in joint-Service program management. The guide was published by the Defense Systems Management College in March 1980.[4]

Chapter 48

Industry Concerns and DOD Actions

In the middle of the 1970s, industry voiced a concern that not all system acquisition policies issued by OSD were being carried out as intended. The industrial associations sounded the alarm. The NSIA, in a letter to Clements in April 1975, identified industry concerns and offered suggestions for improving the credibility of the DOD procurement process "in the eyes of the public and Congress, and strengthen mutual trust and respect between DOD and industry in the contractual relationship."[5] An attachment to the letter addressed such problems as excessive requirements, underestimating, overoptimism, unrealism of costs and schedules, buying-in, best and final offers (an auctioning technique), cost growth overcontrol of industry and change orders. The proposed remedies included ways to reduce acquisition costs, develop more realistic cost estimates, enhance the integrity of the procurement process, and improve the DOD-industry relationship.

After thoughtful consideration of the industry recommendations, revisions were made to DOD directives and instructions, and to appropriate Service regulations. In some cases, problems were eliminated when the intent of the directives already issued were clarified. One of the actions taken by Clements in August 1975 was to require the military managers of 59 designated programs to report program status to him directly on a monthly basis.[6] This action by Clements stirred up the military departments and helped bring about some constructive actions within the overall acquisition process. When Charles W. Duncan, Jr., succeeded Clements in 1977, this reporting procedure was discontinued on the basis that it had served its purpose. It is important to note that although DOD made a sincere effort to resolve the problems highlighted by industry, many of the problems continued to persist.

Chapter 49

Acquisition Advisory Group Report

In April 1975, Clements established an acquisition advisory group (AAG) composed of persons at the executive level representing a wide spectrum of professional backgrounds and experience, military and civilian, in various functional areas bearing on defense systems acquisition.

The AAG was given a charter to examine and assess the recommendations contained in recent reports of the Army Material Acquisition Review Committee (AMARC), the Navy/Marine Corps Acquisition Review Committee (NMARC), and the recommendations of the Secretary of the Air Force regarding the management of defense systems acquisition at the OSD level. The September 1975 AAG report submitted by Alexander H. Flax, its chairman, stated that "...acquisition management problems in OSD arise from well-motivated but inappropriate and largely ineffectual attempts to compensate at the level for failings in the military departments and program offices in the detailed execution of weapon systems acquisition programs."[7]

Recommendations made by the AAG were thoroughly studied within OSD and the Services. As a result, a series of positive actions were taken. For example, responsibility for programs that had passed Milestone III (commitment to production) was delegated to the Service Secretaries for surveillance; DSARC reviews of programs meeting objectives were held only in connection with major decision milestones; several programs were transitioned to Service control. Joint-Service, strategic, or internationally oriented programs, as well as those of major importance, continued under OSD direct decision control.

Chapter 50

Profit Policy

In May 1975, the Deputy SECDEF initiated a study to revise the DOD profit policy. This study, known as "Profit '76," was conducted for the purpose of finding a way to correct some of the deficiencies found in earlier profit policies and to motivate defense contractors to make investments that would lower DOD systems acquisition costs. The study, which reviewed a five-year period, disclosed that major defense contractors realized an average pretax profit of 4.7 percent on sales of defense hardware and a 17.1 percent profit on their sales of commercial products. Further, the contractor's level of investment in facilities used for defense work was 10.9 percent of annual sales dollars as compared with 41.1 percent for facilities used for commercial work. Clements concluded that many defense contractors believed defense business was not sufficiently profitable for the risks involved.

At the completion of its study, the "Profit '76" team arrived at the following policy, which has been in effect on DOD programs initiated since completion of the study:

— Recognize capital (facilities) as a real and essential ingredient of contract performance.

— Uniformly compensate contractors for the time value of facilities capital employed at an imputed interest rate associated with a risk-free investment. Treat this imputed interest as an allowable contract cost.

— Recognize that a special risk attaches to capital investments made for defense work. Provide contractors the opportunity to earn profit to compensate for this risk.

— Emphasize effort and risk as profit determinants rather than contract costs.

— Recognize productivity as a factor in establishing the profit objective for a contract.

The new profit policy focused on a contractor's effort, assumption of risk, and degree of facility investment. The DOD anticipated that the policy would instill in defense industry some motivation for overall cost efficiency. There appeared to be no significant improvements in profit margins as a result of implementation of the policy Consequently, industry acceptance of the profit policy was lukewarm.

Chapter 51

New Acquisition Policy and Directives Issued

In April 1976 the Director, Office of Management and Budget (OMB), and the first Administrator, Office of Federal Procurement Policy (OFPP), issued a new policy for the acquisition of major systems by all executive branch agencies. The new policy, OMB Circular A-109, *Major Systems Acquisition*,[8] was intended to effect reforms that would reduce program cost overruns and diminish the controversy of the previous two decades concerning whether new systems were needed.

The A-109 policy was patterned after DOD directives in the 5000 series, particularly 5000.1. Consequently, it was consistent with the recommendations made by the Commission on Government Procurement in 1972.

As a result of the issuance of the A-109 policy, the SECDEF took the following action:

—Appointed the Under Secretary of Defense for Research and Engineering the Defense Acquisition Executive. The DAE was to be the principal advisor and staff assistant to the SECDEF for the acquisition of defense systems and equipment.

—Called for revision of DOD Directives 5000.1 and DOD Instruction 5000.2 to place additional attention on the front end of a program; i.e., the establishment of the need for a program and the reconciling of that need to DOD capabilities, priorities, and resources.[9]

In August 1976, the Director of Defense Research and Engineering was named the Defense Acquisition Executive; i.e., the principal advisor and staff assistant to the Secretary of Defense for acquisition of defense systems and equipment.[10] As such, he was to chair the DSARC. At that time, the ASD (Intelligence) and the Director of Telecommunications and Command and Control Systems (DTACCS) were made full-time members. The ASD (Systems Analysis) was redesignated Director of Program Analysis and Evaluation (PA&E).

Additional revisions to DOD Directive 5000.1 and DODI 5000.2 became effective in January 1977.[11] DOD Instruction 5000.2, which became a DOD directive and supplement to DOD Directive 5000.1, provided additional policy and instructions designed to assist the Secretary of Defense in making decisions at program milestones. The major change to *DOD Directive 5000.1* was the incorporation of the concepts (not already part of this Directive) contained in OMB Circular A-109. The OMB circular stressed the importance of considering alternatives at the front end of a program; accordingly, the revision to DOD Directive 5000.1 added the requirement for a Mission Element Need Statement (MENS) at a new Milestone "0."

The new Milestone "O" that was added to the front end of the defense systems acquisition process avoided renumbering of the original milestones, and the possibility of creating unneeded

confusion. According to the new procedure, the milestone decisions and phases of activity were as follows:

—**Milestone O Decision**. Approval of MENS and authorization to proceed into the Concept Exploration Phase (Phase O). The MENS identifies the mission, threat (basis for the mission), existing capabilities to accomplish mission, assessment of need, constraints, resources, and schedule to reach Milestone I.

—**Milestone I Decision**. Selection of most promising alternative concepts and authorization to proceed into the Validation Phase (Phase 1).

—**Milestone II Decision**. Selection of the preferred alternative concept(s) and authorization to proceed into the Full-Scale Development Phase (Phase II), which includes limited production prior to operational test and evaluation. SECDEF approval also indicates his intention to deploy the system.

—**Milestone III Decision**. Authorization to proceed into the Full Production and Deployment Phase (Phase III).

On a major defense system program, only the SECDEF had the prerogative to permit the omission of one or more of the program milestones or phases and to authorize "go-ahead" on the next one. Information for the SECDEF and the Congress dealing with quarterly post-Milestone III status and threshold breaches on major defense systems was reported in the Selected Acquisition Report (SAR) as was practiced previously.

Other significant changes and additions to DOD Directive 5000.1 included raising the minimum dollar values of "major" new acquisitions, a new emphasis on decentralization, the addition of the Service system acquisition review council (SARC) reviews, and some revisions to the DSARC procedures.

The DSARC procedural changes (defined in DOD Instruction 5000.2) were as follows:

—The DSARC would not participate at Milestone 0.

—The DSARC would only be involved at Milestone I if the program under review was classified as strategic; nuclear; joint-Service; multinational; intelligence; or command, control, and communications.

—The DSARC reviews would be held on all major acquisitions at Milestones II and III, unless waived by the Secretary of Defense.

—Administrative responsibility to process the various versions of the DCP was assigned to the Services.

Industry, in an appearance before the House Armed Services Subcommittee on Research and Development in April 1978, indicated its support for improvements to the systems acquisition process – in this case, the issuance of A-109. The subcommittee was told that implementation of the policy would "improve the understanding by all participants of mission needs and goals; increase reliance on the private sector, enhance the competitive spirit...better focus responsibilities and authority, and increase and improve communications with Congress."[12]

Chapter 52

Four-Step Source Selection Process

In 1976, DOD issued a revision to DOD Directive 4105.62[13] on selection of contractual sources. This revision established a four-step process for the procurement of advanced development, engineering development, and operational systems development effort. The reason for the new process was to put an end to the charges that DOD was engaging in unfair competition and using unsound business practices in evaluating the proposals and capabilities of companies competing for a contract.

The four steps in the source-selection process are summarized below:

- Submission and evaluation of technical proposals

- Submission and evaluation of cost/price proposals and, if appropriate, revised technical proposals

- Establishment of a common cutoff date for receipt of final revisions to the technical and cost/price proposals

- Negotiation of a definitive contract with the selected offeror.

The four-step process forced more government-industry dialogue prior to solicitation. Also, technical leveling, technical transfusion and auctioning were reduced. Buy-ins were declined.

Chapter 53

Zero-Base Budgeting

One of the first actions by President Jimmy Carter after taking office in 1977 was to direct the agencies within the executive branch to implement a zero-base budgeting (ZBB) process for preparation of the fiscal 1979 and future budgets.[14] The ZBB was a management process providing for the systematic consideration of all programs and activities in conjunction with program planning and the formulation of budget requests. The principal goals of ZBB were to examine the need for existing programs; allow proposed new programs to compete with existing programs on an equal footing for resources; focus budget justifications on evaluation of programs; and secure extensive managerial involvement at all levels in the budget process.

Chapter 54

Planning, Programming, Budgeting System Refined

In October 1977 the new SECDEF, Dr. Harold Brown, directed that the PPBS be revised to achieve the following objectives:

— Permit the SECDEF and the President, based on the advice of all appropriate offices and organizations in the DOD, to play an active role in shaping the defense program.

— Create a stronger link between planning the programmatic guidance and fiscal guidance.

— Develop, through discussion, a sound and comprehensive rationale for the defense program.

— Ensure the defense program is based on sound analysis and contributions from all relevant offices.

Brown believed the revised system would provide a more coherent basis for guiding the military departments in the preparation of their specific POM. The revised system provided consolidated guidance to the military departments and defense agencies. The consolidated guidance identified fiscal guidance at three fiscal levels — minimum, basic, enhanced — in accordance with ZBB requirements.

A major problem, in the defense systems acquisition process still to be solved, was how to effectively connect the SECDEF decisions following DSARC meetings to the PPBS.

Chapter 55

Defense Resources Board

Assertions of inefficiencies in the area of DOD resources management were the basis of a presidential initiative that resulted in the commissioning of a Defense Resources Management Study (DRMS) in November 1977.[15] That study was intended to provide a "searching organizational review into several resources management issues." Among the areas addressed were the resources allocation decision process; the planning, programming and budgeting system; and the defense systems acquisition process.

The DRMS report suggested that a Defense Resources Board (DRB) be established. Accordingly, the DRB was established by Secretary of Defense Harold Brown in April 1979 to enable the DOD to better respond "to signals emanating from Congressional budget reviews and meet Presidential decision requirements."[16]

The DRB, chaired by the Deputy SECDEF, was given a charter to accomplish the following:

— Improve the efficiency and effectiveness of the PPBS

— Direct and supervise OSD review of the Service program objectives memoranda and budget submissions

— Examine and resolve major Service issues without SECDEF involvement, if possible

— Present recommendations to the SECDEF for action when deemed desirable.

Membership was vested in USDRE, ASD(C), ASD(MRA&L), and Director, PA&E, with the Deputy Secretary of Defense serving as the chairman. *Ex officio* membership was given to the Chairman, Joint Chiefs of Staff. There were six associate members.

The DRB is an advisory body; its actions and recommendations had no authority until specifically approved by the Secretary of Defense, or the Deputy Secretary of Defense acting "independently of his role as DRB chairman." The DRB performed this function, although the method of operation was highly dependent on the chairman's management style. This style has varied from (a) members voting on alternatives to develop a consensus, to (b) open discussion with the chairman to develop a final recommendation.

The DRB usually did not concern itself with particular programs, but was more concerned with the overall task of effective resource allocation within the DOD. Of course, if a program had major problems, for whatever reason, it could become a subject for DRB action. Final DRB recommendations considered the political sensitivities associated with their implementation.

Although not a member of the DRB, the Secretary of Defense attended some of the DRB meetings.

The original role of the DRB was defined as being one of "supervising the OSD review of Service POMs and the budget submission." However, in March 1981, then Deputy Secretary of Defense Frank C. Carlucci revised the role to helping "the Secretary of Defense manage the entire revised planning, programming and budgeting process."[17] The redirection of the DRB was designed "to assure that major acquisition systems are more closely aligned to the PPBS." The number of major issues to be raised before the DRB were to be limited. Lesser issues were to be resolved outside of the DRB forum, and presented only to the DRB when a consensus could not be obtained. Carlucci's memo directed that "DRB members must be more than advocates of their particular areas of responsibility; they must take a broader and deeper DoD view..."

On March 27, 1981, the chairman of the DRB, Mr. Carlucci increased the membership.

Clearly, enhancement of the DRB membership was for the purpose of strengthening the board, particularly with regard to the interactions between the PPBS and the DSARC reviews.

The principal changes to the membership were the addition of the JCS Chairman and the Service Secretaries, as well as the Associate Director from the Office of Management and Budget.

According to Mr. Carlucci, the primary role of the expanded DRB was to help the SECDEF manage the entire revised planning, programming and budgeting system. He planned to hold regular, monthly DRB meetings to (1) review proposed planning guidance, (2) manage the program and budget review process, (3) advise the SECDEF on policy, planning, program, and budget issues, and proposed decisions, (4) perform program evaluations and reviews of high-priority programs on a regular basis, and (5) ensure major acquisition systems are more closely aligned to the PPBS. The DRB chairman said he expected the members to be more than advocates of their particular areas of responsibility; they must take a broader and deeper DOD view and help the SECDEF and DEPSECDEF manage the DOD better.

Frank C. Carlucci, memorandum to the Secretaries of the military departments, Chairman of the Joint Chiefs of Staff, Under the Secretaries of Defense, and others, subject: (disconnect) it had in the past. Figure 17 identifies programs on which action taken during PPBS processing in the past resulted in a 15 percent or greater change in the number of systems previously authorized for manufacture.

Chapter 56

International Environment in the Seventies

During the 1970s, the steady buildup of the Soviet R&D and procurement outlays gave the United States and Western Europe no alternative but to pursue wiser utilization of their combined resources. Failure to do so could have placed the United States and its allies in the position of not being able to preserve credible deterrence and defense in the 1980s.

Western Europe, unhappy with U.S. domination of the defense systems and equipment market throughout the 1950s and 1960s, began to call for a "two-way street"; i.e., reciprocal purchases of defense systems and equipment. The defense industries of our allies were growing. Therefore, unless the United States took the lead in establishing cooperative armaments programs, the trend would probably continue. If it did, it would reduce U.S. exports in Western Europe and prevent interoperability of defense systems or equipment within NATO countries.

This situation provided the background for President Carter's initiatives at the NATO Ministerial Meeting held in England in May 1977. At the meeting, President Carter stated the position of the United States relative to meeting the military and political challenges of the 1980s through the alliance. He said:

> We must make a major effort to eliminate waste and duplication between national programs; to provide each of our countries an opportunity to develop, produce, and sell competitive defense equipment; and to maintain technological excellence in all allied combat forces. To reach these goals our countries will need to do three things. First, the United States must be willing to promote a genuinely two-way trans-Atlantic trade in defense equipment...Second...the European allies (must) continue to increase cooperation among themselves in defense production...Third...European and the North American neighbors of the Alliance (must) join in exploring ways to improve cooperation and procurement of defense equipment...[18]

Dr. William J. Perry, the Under Secretary of Defense for Research and Engineering, identified the primary thrust of the international programs at the close of the 1970s in his FY 1980 Posture Statement to the Congress, when he said, "(It) is the enhancement of the overall military capabilities of the NATO alliance to counter the continued growth of the Warsaw Pact forces." Objectives of the program were:

> — Reduction of duplicative NATO research and development for more effective and efficient use of collective resources
>
> — Promotion of fuller industrial collaboration in military equipment to achieve economies of scale and reduce unit costs

—Enhancement of NATO military strength by procuring more and better military equipment because of the effectiveness of R&D and procurement resulting fr m cooperation

—Enhancement of NATO military strength through increased interoperability and standardization of allied military equipment.

Obviously, the objectives set forth by Dr. Perry would not be easy to achieve. They required a major change to our past business approach.

The Congress took action in support of NATO rationalization, standardization and interoperability (RSI) and its implementation policy However, the Congress reserved the right to resist the purchase of a specific defense system or equipment from a NATO country for one or more reasons. For example, a purchase might be resisted to protect American industry or American military interests. Program managers had been experiencing greater involvement in the multinational environment as a result of President Carter's initiatives and new DOD policies, such as those contained in DOD Directive 2010.6 on standardization and interoperability.[19] The DSARC had to address NATO these requirements before making a recommendation to the SECDEF to enter the next phase of a program.

Part Six Information Sources

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PART SEVEN

VIEWPOINTS ON THE TRANSITION FROM THE SEVENTIES TO THE EIGHTIES

Chapter 57

The United States and Its Adversary

At the beginning of the 1980s, our adversary – the Soviet Union – was much stronger than it was at the start of the 1970s. The United States had been losing ground for many years in force modernization. However, Dr. William Perry, in a statement to the Congress in February 1980, said that the United States was turning the corner and "...if we sustain the momentum of the new five year defense program, the decade of the 1980s will show us, along with our allies, narrowing the gap in the quantity of equipment deployed, while maintaining a qualitative edge." He added that, "in this era of unprecedented change, technological strength is the key to our long-range survival as a nation. A strengthened and vigorous program in defense research, development and acquisition is fundamental to the maintenance of stability and peace in the years ahead."[1]

The United States was behind the Soviet Union quantitatively in deployed weapon systems and had been falling further behind because of disparities in production rates for new systems. Although the United States had maintained a lead in defense technology, it could have lost that lead in the 1980s because the Soviets had greatly increased their investment in defense research and development. Dr. Perry believed that the United States still had some distinctive advantages at that time, namely: "a superior technological base, a competitive industry with greater productivity, and allies with a substantial industrial capability." To meet the formidable challenge the United States faced during the 1980s, the U.S. investment strategy had to exploit the advantages it held.

Chapter 58

Office of the Secretary of Defense Viewpoint

It was Dr. Perry's viewpoint that our defense investment policy during the 1980s must include two important objectives:

— Modernization of U.S. deployed defense systems

— Maintenance of leadership in technology critical to defense.

The size and complexity of the research, development and acquisition effort in the next decade would be a challenge to management. However, if the defense systems acquisition process could be further improved and managed effectively, it might be possible to reduce acquisition costs and delays in deploying new or modified defense systems.

In 1979, the Office of the Under Secretary of Defense for Research and Engineering undertook a series of management initiatives. The objectives, which continued into the 1980s, were to:

— Increase competition in procurement

— Use technology to achieve major cost reductions in manufacturing

— Extend the useful life of existing defense systems through product improvement

— Improve cooperation with U.S. allies in armaments development and production

— Accelerate the acquisition process by permitting tailoring when the benefits appeared to outweigh the cost of increased risk and extraordinary attention by management. Successful implementation of the initiatives would place the United States in a better defensive posture at the end of the decade.

Dr. James P. Wade, Jr., Assistant SECDEF (Atomic Energy), at a presentation at DSMC in April 1980, suggested some options for coping with the potential shortfall in deployed defense systems before the end of the Eighties. The options he saw were as follows:

— Allow the defense systems in the current inventory to age

— Redesign the defense systems to achieve lower unit costs

— Reduce force levels to equalize operating and modernization needs

—Extend the effective operational life of all defense systems by preplanned product improvement.[2] Dr. Wade, as well as the Joint Logistic Commanders, suggested that more attention be focused on the fourth option.

A report of a DSB task force chaired by Dr. Richard D. Delauer, a corporation executive, now deceased, summed up the problems of the decade this way:

> The progression of acquisition policy changes from Total Package Procurement through the DSARC process, fly-before-buy (to reduce risks), full-scale prototyping, increased emphasis on operational test and evaluation...has evolved out of the perceived need to correct deficiencies observed in specific programs by introducing additional management review and decision checkpoints to assure past mistakes would not be repeated. These procedural changes have become institutionalized and have been applied inflexibly to all programs with the result that the acquisition process has steadily lengthened and the procurement of defense systems has become increasingly costly.
>
> Lack of realism in the estimation of program costs, changes in specified performance requirements, inflation, and other such causes of cost growth have caused the aggregate cost of planned production programs to substantially exceed the allocated budgetary resources. (This has resulted in a)...need to delay the completion of the production phases of programs in order to fit the total available defense budget each year.[3]

The DSB recommended that DOD directives focusing on major defense systems acquisition be updated to:

—Stress the need to consider the affordability of acquiring the defense system at every milestone

—Introduce the concept of flexibility and timeliness throughout the defense systems acquisition process

—Encourage combining decision milestones whenever possible

—Discourage system prototyping unless the prototype is producible

—Encourage joint development and operational testing, and independent evaluation

—Require program decisions be correlated with the PPBS

—Establish that the Milestone III decision represents approval of rate production

– Emphasize the upgrading of existing defense systems is a desirable alternative to new defense system development, whenever feasible.

The DSB recommendations were incorporated into the latest revisions of DOD Directive 5000.1[4] and DOD Instruction 5000.2[5]. The revision to the test and evaluation directive (5000.3)[6] and the integrated logistic support directive (5000.39)[7] – replacing DOD Directive 4100.35 – incorporated new or revised policies based upon lessons learned in the 1970s.

The DOD Directive 5000.1 revision contained only minor content changes. For example, the DSARC review was to take place at Milestones I, II and III, unless waived by the Secretary of Defense. Previously, DSARC reviews at Milestone I took place only under the conditions indicated above. Henceforth, Secretary of Defense approval at Milestone II was to indicate that deployment of the defense system could be expected. The DOD Instruction 5000.2 contained several changes: the dollar thresholds defining major systems were raised again; the ASD (Intelligence) and the DTACCS were removed from DSARC membership and the Under Secretary of Defense (Policy) and the Chairman, Joint Chiefs of Staff, were added; and the presence of component heads was permitted during pre- and post-DSARC review activities, but not in the DSARC review itself.

In 1980, pre-DSARC review activities changed significantly. Rather than just reviewing the DCP, the DSARC members were tasked with structuring the DCP. Because of this change, the timetable for pre-DSARC activities was fixed at six months. In addition to the DCP, an Integrated Program Summary (IPS) was created to provide details of the implementation plan for the life cycle of the system. The combined DCP/IPS became the governing document for DSARC reviews. Further, because the amount of information accumulated for each milestone review was increasing, a milestone reference file (MRF) was established.

Considerable achievements were made in streamlining the acquisition process. Emphasis was placed on flexibility and tailoring to achieve what "makes sense" for each program. Four decision points and distinct program phases remained. The "Milestone 0" decision for program initiation was replaced with the term, "mission need determination (MND)." The Secretary of Defense remained the decision-maker for program initiation and Milestones I and II. The production decision was delegated to the appropriate Service Secretary. On an exception basis, the Secretary of Defense could retain his decision authority at Milestone III, if he chose to do so.

According to this policy, the program initiation decision for a new major program occurred during the PPBS process. The DOD component submitted a Justification for Major System New Start (JMSNS) vice the Mission Element Needs Statement, no later than that point in time when the Service POM was sent to OSD. Approval and program directions were included in the Secretary of Defense Program Decision Memorandum (PDM), vice Secretary of Defense Decision Memorandum (SDDM). The SDDM documented a joint program decision. A JMSNS was required for any program (major or nonmajor) for which the DOD component estimated the

costs (FY 1980 dollars) would exceed $200 million in RDT&E funds, or $1 billion in procurement (production) funds, or both.

The new component-prepared abbreviated Milestone I document, the System Concept Paper (SCP) was used in place of the DCP and IPS. These last two documents (in abbreviated formats) remained as Service documentation to support Milestones II and III. The PDM documented the Secretary of Defense decision and direction. The Services were required to prepare, and submit to the DSARC for approval, Test and Evaluation Master Plans (TEMP) prior to Milestones II and III.

The Milestone II decision-point timing became flexible and it could occur at the traditional point (entry into FSD), or after entry into FSD if there was a need to more fully define the system being developed. The point of decision was included in the Service acquisition strategy. If a delayed Milestone II was anticipated, FSD contracts had to include provisions for early program termination at minimum cost to the government.

Among other top-level documents prepared or revised in the early 1980s were those covering reliability and maintainability, specification tailoring, manufacturing technology, embedded computer software, value engineering and contractor incentives. A move toward greater use of commercial products, services and practices was also initiated.

Chapter 59

Defense Industry Viewpoint

Many staunch industry supporters of the maturing defense acquisition process became concerned about the deteriorating health of the defense industry. They attributed at least some of this to the factors listed below, as put forward by Oliver C. Boileau, Jr., a corporation president.

— Innovation was being discouraged.

— The United States was not producing enough defense systems.

— Too many "review boards" were capable of scrapping a program. Their decisions may have been based on political, rather than military, considerations.

— Reporting requirements were too numerous.

— Industry profits were too low, resulting in many defense contractors seeking nondefense business.

— The government shifted its role from that of partner to dominate partner to what, in many respects, might be considered an adversary.[8]

The DOD and industry management agreed that acquisition of new defense systems was taking too long. The 12 or more years usually required to bring new systems into the inventory was intolerable; therefore, a way had to be found to reduce the time. Part of the problem, Boileau pointed out, was that a typical major defense system being procured for the inventory had to run an "obstacle course" from its conception until the last unit was delivered to the customer. Sometimes defense system technology became obsolete before all units were delivered. Also, the need for the system — based on capability to meet a threat — often changed while the system was in production. If the need for the system ceased to exist, production must be canceled. When such a cancellation occurred with little or no warning, it could throw involved contractors into extreme financial difficulty.

The DOD had to find a way to cope with the conditions cited above, or defense contractors wouldn't be willing to invest substantial funds of their own in new defense system concepts. A strong industry resistance was developing to investing in the facilities and equipment necessary to economical production because of the continually shrinking production requirements.

Chapter 60

Congressional Viewpoint

Before presenting the congressional viewpoint, some "stage setting" might be in order. The Congress usually accepted technological parity with the U.S. adversary as a criterion for supporting the acquisition of defense systems and equipment. Congressional committees consistently placed pressure on DOD officials to:

- Carefully assess the threat, and determine U.S. needs
- Improve the planning and budgeting process
- Complete programs in a timely and cost-effective manner
- Control cost growth
- Cancel nonproductive programs.

Generally, the Congress disapproves follow-on effort on marginal programs.

Through the years there was constant striving to improve the resource allocation process. In the DOD, an annual review of mission areas proved to be a beneficial way of placing defense systems acquisition programs in a broader perspective. Accordingly, the Commission on Government Procurement recommended the congressional budget proceedings begin with an annual review by the appropriate committees of the missions, capabilities, deficiencies, and the needs and goals for new acquisition programs. This could then form a basis for budget reviews. The concept was adopted in the Congressional Budget and Impoundment Control Act of 1974. In accordance with the Act, the FY 1979 President's defense budget contained the first mission-oriented display of the DOD programs. Most budgets contain such displays; however, Congress has shown very little enthusiasm for examining Service programs from this perspective.

Every year the Congress reviews the current defense posture and policies, determines the priorities for defense spending, and authorizes funding. To do so requires considerable study, patience and time. To accomplish this task effectively, the congressmen find it advisable to call upon military and civilian experts in DOD to serve as witnesses and provide advice. In addition, congressmen must call on their staffs for support.

When the time comes to cast a vote, the decisions of the congressmen are based on their appraisal of, and confidence in, the expert witnesses, advice of industry executives and representatives of the industrial associations, arguments posed by military lobbyists, and findings and recommendations of their staff members.

Chapter 61

International Program Arena

The number of defense systems acquisition programs in the international arena continued to grow. As it did, more U.S. program managers were affected by the many managerial problems that had to be solved. Before any program manager could function effectively in this arena, proponents of international programs had to take additional steps to resolve their differences and reach a common understanding on benefits to be gained by international programs.

Managers of defense system programs had a limited, but extremely significant, role to play in the international arena. The DOD officials viewed the acquisition of defense systems as the activity that followed the marking of essential policy-level decisions between the allied nations. The program managers who led performance in this arena needed a first-hand knowledge of the policy and a clear understanding of procedures and techniques that would lead to successful internationalization of defense systems acquisition programs.

Part Seven Information Sources

1. U.S. Congress, statement of Dr. William J. Perry on the FY 1981 Department of Defense program for Research, Development and Acquisition, 96th Congress, 2d session, February 1, 1980.

2. Statement by Dr. James Wade, "Acquisition Shortfalls and Options," an ADPA Seminar/Workshop on Preplanned Product Improvement held at the Defense Systems Management College, Fort Belvoir, Va., April 23, 1980.

3. Report of the Acquisition Cycle Task Force to the Chairman of the Defense Science Board, based on the 1977 Summer Study, March 15, 1978.

4. U.S Department of Defense Directive 5000.1, "Major System Acquisitions," March 19,1980.

5. U.S. Department of Defense Instruction 5000.2, "Major System Acquisition Procedures," March 19, 1980.

6. U.S. Department of Defense Directive 5000.3, "Test and Evaluation," December 26, 1979.

7. U.S. Department of Defense Directive 5000.39, "Acquisition and Management of Integrated Logistic Support for Systems/Equipment," January 17, 1980.

8. Oliver C. Boileau, Jr., "Defense Industries and Government: Foolish Adversaries," *Government Executive*, August 1979, pp. 24-26.

PART EIGHT

DECADE OF THE EIGHTIES

Chapter 62

Department of Defense Acquisition Improvement Program

In the spring of 1981, Deputy Secretary of Defense Frank C. Carlucci, perceiving a need for economy and efficiency in defense systems acquisition, chartered five working groups composed of representatives from the Office of the Secretary of Defense and the Services. These working groups reviewed the current defense systems acquisition process and, by means of a combined report, recommended changes to the process. This report, which included inputs from industry, was submitted to the Deputy Secretary of Defense on March 31, 1981.

After reviewing the report and discussing its contents with the Secretary of Defense, the Joint Chiefs of Staff, the Service Secretaries, and others, Mr. Carlucci wrote, "...the Secretary and I have decided to make major changes both in acquisition policy and the acquisition process itself." Accordingly, on April 30, 1981, Mr. Carlucci initiated a series of 31 innovative actions. On July 27, 1981, he added another action – Competition. Taken together, these innovative actions became known as the Department of Defense Acquisition Improvement Program.

The innovative actions included the following:

1. Reaffirmation of the major acquisition management principles

2. A method for making preplanned product improvements

3. A method for multiyear procurement ensuring the acquisition of property and services in the most economical manner, consistent with sound judgment. The economics and efficiencies of multiyear contracts would be balanced against risks from unstable operational, technical, design or quantity requirements. The criteria presented as guidelines for decision-makers included:

   – Benefit to the government

   – Stability of requirement

   – Stability of funding

   – Stability of the configuration

   – Degree of cost confidence

   – Degree of confidence in contractor capability

4. A method for ensuring program stability

5. A method encouraging capital investment to enhance productivity. Associated with this action was to be a/an:

—Plan to permit more rapid capital depreciation

—Plan to structure contracts to permit companies to share in cost reductions resulting from productivity investments

—Plan to increase the use and frequency of milestone billing and advanced billing

—Plan to provide for negotiating of profit levels commensurate with risk and contractor investment

—Plan to grant equitable economic price adjustment (EPA) clauses in all appropriate procurements

—Plan to increase emphasis on manufacturing technology programs

—Plan to provide a consistent policy which would promote innovation by giving contractors all the economic and commercial incentives of the patent system and protection of proprietary rights and data

—Effort to repeal the Vinson-Trammell Act which imposed profit limitations.

6. A method for budgeting to most-likely or expected costs, including predictable cost increases due to risk, instead of the contractually agreed-upon cost

7. A policy requiring the Services to fund programs at economic production rates

8. A plan to ensure appropriate contract types were used on defense systems programs

9. (and 31.) These initiatives were concerned with improved readiness. They required that resources to achieve readiness receive the same emphasis as those required to achieve schedule or performance objectives.

10. A plan to reduce administrative costs and time to procure items

11. A plan to evaluate, quantify and budget for technological risk on a program

12. A plan to provide adequate front-end funding for test hardware

13. A requirement to establish a joint OSD and Service team to weigh the impact of various governmental requirements and regulations on the efficiency and effectiveness of the total DOD acquisition and contracting process

14. A requirement to establish a joint OSD, Service, and industry team to provide recommendations to substantially reduce the number of directives and documentation required in contracts

15. A requirement to establish procedures to provide funding flexibility within a given fiscal year from procurement to research, development, test and evaluation when the SECDEF determined it is in the national interest to do so

16. A requirement to establish guidelines to incentives contractors to improve reliability and support

17. A plan to reduce the number of briefings and data required for a DSARC review

18. A plan to budget for inflation effectively on major defense system acquisition programs

19. A plan to forecast effectively the business conditions at major defense plants

20. A plan to improve the source selection process

21. A requirement to develop and use standard operational and support systems

22. A requirement to (a) provide appropriate incentives to industry by associating fee awards with the actual costs achieved during the early production runs on a program, and (b) make Design-to-Cost (DTC) awards and offer incentives based on evidence during early production runs that DTC goals are being achieved

23. Assignment of overall responsibility to the Under Secretary of Defense for Research and Engineering (USDRE) for implementation of the DOD Acquisition Improvement Program

24. A requirement to revise DOD Directive 5000.1 and DOD Instruction 5000.2 to reflect the decision milestones selected for defense system programs

25. A requirement to revise DOD Directive 5000.1 and DOD Instruction 5000.2 to require submission of a Mission Element Need Statement (MENS) no later than the Service POM, thereby linking the acquisition and the PPBS processes

26. A requirement to include the appropriate Service Secretary or Service Chief as a full member of the DSARC

27. A requirement to retain the USDRE as the Defense Acquisition Executive (DAE)

28. A requirement to establish the criterion for the defense systems to be reviewed by the DSARC

29. A requirement to establish the criterion for integrating the DSARC/PPBS decision

30. A requirement to give the program manager a voice in the resource allocation and budget execution process through increased and centralized resource visibility and coordination by the program manager on changes to his plans (This initiative was a cornerstone in the implementation of the management principles on improving readiness and delegating authority.)

31. A requirement to include improvement of reliability and support in the action taken to satisfy Initiative 9

32. A requirement to increase competition in the acquisition process (This initiative, added on July 27, 1981, was favorably received by the military services and the defense agencies.) Based on the objectives, the Office of the Under Secretary of Defense issued a memorandum on November 10, 1981 tasking the military services and the defense agencies to:

- Designate advocates for competition at each procuring activity
- Establish goals for increasing competition
- Ensure commanders understood their responsibilities with regard to competition
- Make competition a matter of special interest
- Develop procedures to identify and elevate significant achievements.

The DOD Acquisition Improvement Program orchestrated by Mr. Carlucci placed emphasis on improving long-range planning, shortening the acquisition time, budgeting more realistically, reducing acquisition costs, and enhancing program stability. To accomplish these objectives, the OSD and the DOD components had to delegate more responsibility and grant more authority to managers at lower echelons. Specifically, the SECDEF expected program managers to be given sufficient responsibility and authority, along with adequate resources, to efficiently execute their assigned tasks. Program managers were to be held accountable for the success of their programs. The DOD components were expected to examine evolutionary alternatives to satisfy identified mission needs — alternatives that involved lower risks. Alternatives requiring solutions at the frontier of technology were to be minimized or avoided, if possible.

Implementation of the action that involved identifying the criterion for defense systems reviewed by the DSARC, resulted in a new definition for a "major defense system." According to the new definition set forth in the revision of DOD Directive 5000.1, in March 1982, DOD would continue to be guided by the criteria in OMB Circular Number A-109. However, DOD interpretation of the criteria was changed to state:

> The decision to designate any system as major may, after consultation with the appropriate DoD component, be based upon . . . the estimated requirement for the system's research, development, test and evaluation, procurement (production), and operation and support resources. A Justification for Major System New Start (JMSNS) document [replaces MENS] be required for all acquisitions for which the DoD Component estimates costs to exceed $200 million (FY 80 dollars) in RDT&E funds and/or $1 billion (FY 80 dollars) in procurement (production) funds.

As a result of this action, 10 programs were removed from the list of major programs; i.e., the number of major programs dropped from 52 to 42.

Other programs initiated prior to the implementation of the DOD Acquisition Improvement Program that were still designated major were examined at the OSD level to determine where more decentralization could be authorized. As a result of the examinations, the following delegations were made to the Services by the DSARC:

- Near-Term Scout Helicopter — Milestone I decision
- Multimission Destroyer (DDGX) — Milestone I decision
- Over-the-Horizon Backscratcher Radar (OTH-B) — Milestone I and III decisions
- Tomahawk Cruise Missile — Milestone III decision
- KC-135 Re-engine Program — Milestone III decision
- Hellfire Missile — Milestone III decision.

Changes to Basic Process Resulting from Acquisition Improvement Program.

The basic acquisition process, prior to the implementation of the DOD Acquisition Improvement Program, provided four discrete SECDEF decision points. Implementation of the action involving decision milestones, resulted in the number of formal OSD milestone reviews being reduced from three to two, and the number of SECDEF decisions being reduced from four to two. Although the SECDEF gave up the Milestone 0 and III decisions, he retained indirect control of Milestone 0, through the JMSNS/POM actions, and Milestone III by reserving the right to hold a project review or to make a decision regarding production when project breached a previously established threshold.

The DOD Acquisition Improvement Program emphasized the program manager's authority and responsibility to tailor his acquisition strategy to accommodate the unique features of the program. This was to be done, provided the strategy did not violate the basic logic for system acquisition problem-solving or the principles set forth in DOD Directive 5000.1 for business and

management considerations. For example, the program manager was to recommend to the DSARC the timing of the Milestone II decision point. This recommendation was to be made when the DSARC was reviewing the program at Milestone I, preparatory to making a recommendation to the SECDEF to validate the requirement and to proceed with the Demonstration and Validation Phase. The Milestone II decision was to be made when sufficient information became available on performance, cost schedule, producibility, industrial base responsiveness, supportability, size of the risk and affordability.

There were four changes to the basic acquisition process, resulting from the DOD Acquisition Improvement Program, that deserve special attention:

1. The Mission Element Need Statement (MENS), which documented major deficiencies and required consideration and approval by the SECDEF prior to program initiation, was no longer used. The mission need determination was incorporated into the PPBS. The major deficiencies (or opportunities for improvement) were documented in the DOD component's JMSNS, a document submitted to the SECDEF as a part of the POM. This procedure provided better integration of the acquisition process and the PPBS because "new starts" were reviewed in the context of the full service/DOD budget formulation process. The SECDEF provided appropriate program guidance in the program decision memorandum (PDM). He also provided official sanction for a new program start and authorized the DOD component, when funds became available, to proceed with the Concept Exploration Phase of the acquisition process. The DOD budget submitted to the Office of Management and Budget acknowledged endorsement of the JMSNS by the OSD.

On a program involving more than one DOD component, such as the Advanced Medium Range Air-to-Air Missile (AMRAAM) program, the SECDEF Decision Memorandum (SDDM) was issued to specify the lead DOD component and provide guidance on the responsibilities of the participating DOD components. The lead DOD component assigned a program manager and requested the participating DOD components assign a deputy program manager.

2. The first explicit decision by the SECDEF on a major defense systems program occurred at Milestone I. This milestone represented a validation of the requirement against the preliminary evaluation of concepts, cost, schedule, affordability and readiness objectives. The SECDEF approval at this point signified authorization to enter the Demonstration and Validation Phase and develop the system sufficiently to support a Milestone II decision. The DSARC based its recommendation to the SECDEF on an SCP, prepared by the concerned program office to identify alternatives. The SCP was submitted to the DSARC in lieu of the decision coordinating paper (DCP), the IPS, and the MRF, prepared for submittal in the past. Included in the SCP, in addition to the program alternatives, were a summary of results of the Concept Evaluation Phase, the objectives to be met at the next program milestone, the acquisition strategy recommended, including the nature and timing of the next SECDEF decision point, and a "not to exceed" dollar threshold to carry the program through the next milestone. An SDDM was issued by the SECDEF following approval of Milestone I.

A Milestone I decision by the SECDEF authorizing a "delayed" Milestone II decision and implied go-ahead to enter the early portions of the FSD phase of a program. However, a program might be delayed or terminated when there was change in a requirement, a threshold was breached, the schedule was not met, and/or cost and technical difficulties arose that couldn't be overcome.

3. The second explicit SECDEF decision occurred at Milestone II (program go-ahead). Secretary of Defense approval of this milestone signified authorization to proceed with FSD. The timing of Milestone II decision was flexible and depended on the tailored acquisition strategy approved by the SECDEF at Milestone I. In the traditional approach, Milestone II would have occurred when the program was about to enter the FSD phase. However, it was sometimes desirable to delay this decision, based on the acquisition strategy briefed at DSARC I. Documents supporting the Milestone II decision were the DCP and IPS. The DCP, a top-level summary document, identified the alternatives, goals, thresholds and costs. The IPS, which did not repeat data in the DCP, provided more specific information and a comprehensive summary of the program. The milestone reference file was no longer required. An SDDM was issued by the SECDEF indicating an approval of Milestone II requirements.

The AMRAAM missile, the Near-Term Scout Helicopter, and the Seek Talk communications programs received approval to delay the Milestone II decisions. In the first two programs, Milestone II was delayed until after preliminary design review; on the third program, Milestone II was delayed until after critical design review. This procedure ensured that more information was available when the time came to make the program go-ahead decision.

If the manager of a major defense system program initiated prior to the DOD Acquisition Improvement Program, when the Milestone II was not "flexible," wished to propose a Milestone II decision, he could do so by preparing and submitting an SCP (containing the appropriate acquisition strategy) to, and receiving approval of, the Defense Acquisition Executive before his program entered the FSD phase.

4. The production decision (Milestone III) was delegated to the DOD component heads, provided the program objectives and threshold established at Milestone II and recorded in the decision coordinating paper and integrated program summary were not breached. The DOD component heads were strongly encouraged to redelegate their authority to the lowest level in the component organization at which a comprehensive view of the program rested. If the thresholds were breached, a formal program review at Milestone III by the DSARC could be required. When this occurred, a DCP and an IPS were prepared to describe the program changes since Milestone II and to establish new thresholds. The delegation at Milestone III was a part of the controlled decentralization plan. It could reduce the administrative burden and, possibly, shorten the acquisition time.

The revised DOD Instruction 5000.2 required provision of information about the contents of the documents used in DSARC milestone meetings and program reviews. The formats of the documents to be used in milestone meetings and program reviews were contained in a

memorandum from the Defense Acquisition Executive. Furthermore, the Instruction pointed out that in addition to the formal milestone decision points described above, a less formal program review could be held at any point in the acquisition of a major defense system. Program reviews, held at the call of the Defense Acquisition Executive, were narrower in scope than the full DSARC assessments. The program manager was informed in advance of the purpose of the review and the type of documentation to be submitted. Direction resulting from a program review that changed a program goal, threshold or other previously approved direction was documented in an SDDM. During the first year of the new administration, 12 program reviews and only one formal milestone review were held.

Challenges and Potential Awards

To fully implement the DOD Acquisition Improvement Program, Service management and program mangers had to meet and overcome several challenges, for example:

—Service management had to delegate more authority to managers of major defense systems programs. In turn, program managers had to decentralize the principal functions within the program office, and delegate some of their workloads to capable subordinates.

—The Services had to become familiar with new procedures associated with program initiation. The JMSNS and the Service POM had to be prepared and coordinated before authorization to start a new program is granted.

—Program managers had to tailor program strategy to the peculiar needs of the program, giving particular attention to the flexibility available in establishing the timing of the Milestone II decision. It was possible to make the decision for program go-ahead (or termination) well after full-scale development began, provided there were good and sufficient reasons.

—All decision-makers, including program managers, were held accountable for actions taken (or not taken). With the increased emphasis on controlled decentralization, program decisions made by line officials above the program manager required documentation with appropriate accountability.

With the implementation of the DOD Acquisition Improvement Program, there was an expectation at many levels within the Services that authority would be delegated to a much greater degree than previously. Further, it is anticipated that the military services would reduce the number of reporting and reviewing requirements, thereby freeing up program managers to carry out the tasks suggested by the Acquisition Improvement Program.

One of the objectives of the changes to the defense systems acquisition process was to make it more effective and able to proceed at a faster pace. If the Services really wanted such changes, the Acquisition Improvement Program provided them with a vehicle for it. But the people in charge had to be willing to be innovative, then follow it through. The new environment

was a distinct change from the conservatism that had prevailed in the past. It provided an open-mindedness to different strategies, an opportunity to articulate one's needs, and willingness of DOD management to try new approaches.

The program manager could be innovative in planning his acquisition strategy. The success of his approach was evaluated initially by the JMSNS (provided the program manager had been appointed prior to that time), then by the DSARC at Milestone I, and again by the DSARC at Milestone II. The program manager was given greater authority and responsibility in the new environment, and had more flexibility in managing his program. Commensurate with his authority and responsibility, he was to be held accountable for his actions and the success (or failure) of his program.

Assessment of Acquisition Improvement Program Actions

A review of DOD Acquisition Improvement Program at the close of 1983 revealed that 13 of the original 32 initiatives were fully implemented and working well. The remaining initiatives were consolidated into six major areas requiring high-level management emphasis. The six areas were: program stability, multiyear procurement, economic and stable production rates, realistic budgeting, improved support and readiness, and encouraging competition.

Program Stability

Repeated stops, starts and stretch-outs on major programs caused defense system costs to soar and created inefficiencies in the defense industry. Thus, some program changes were made to capitalize on important technological opportunities, or to respond to changes in the threat. Where the trade-offs are clearly in our country's best interest, they could not, and should not, be avoided. Of course, arbitrary program changes are always the most costly. In a report to the Congress in October 1983, then Deputy Secretary of Defense Paul Thayer stated, "We are trying to maintain a steady course on our long-range programs and to stay within the budget baselines we set. That requires some tough decisions to assure that our most essential programs remain healthy and efficient. We have cancelled or reduced many lower priority programs - 124 reflected in the Fiscal Year 1984 budget - actions that saved almost $9 billion for the period Fiscal Years 1981-1988 . . . We carefully review proposals for new programs which will require more money. During the summer of 1983, when I presided over the Defense Resources Board's review of Service proposals for new programs, we approved only those of the highest priority . . . We are doing what we can to restore much needed stability to defense business. But during action on the Fiscal Year 1983 budget, Congress cut, reduced, or stretched out more than 200 programs. That continual chipping away at the budget baseline destroys the stability and integrity of defense programs."

Multiyear Procurement

One area of great potential savings that Congress controls is multiyear procurement, an acquisition practice offering substantial savings through more economical lot buying and allowing

industry to make much needed capital investment. Thayer indicated in his testimony that "since Congress expanded our authority to use multi-year contracting in Fiscal Year 1982, the DoD has proposed 34 multi-year programs. From the 17 of these programs that Congress has approved, we estimate savings of about $2 billion over the cost of annual contracting." Congressional actions in 1983 threatened the savings and stability produced by this promising reform. The FY 1983 Appropriations Act had so many restrictions on multiyear procurement that DOD contracting personnel were discouraged from including it in their acquisition strategy. The FY 1984 Authorization Act approved only 7 out of 14 multiyear candidates DOD submitted. Among them were the Army Multiple Launch Rocket System, the Navy NATO Seasparrow Missile, and the Air Force B-1B Intercontinental Bomber.

Economic and Stable Production Rates

To establish the most economical production rates required DOD to plan the most economical and efficient way to phase the procurement of equipment over a period of several years. The DOD established a producibility engineering and planning program to prepare for efficient production during the development phase. Because the changing threat frequently demands a degree of concurrency between system development and production, this program helped to minimize the technical risk and unanticipated cost growth. By thoroughly preparing in this way, DOD has been able to transition smoothly to production and stabilize production rates at economical levels.

Realistic Budgeting

The DOD had sometimes tried to minimize the budgetary impact of its programs by producing overoptimistic cost estimates. This led eventually to cost overruns, and declining confidence in the Department's judgment. Now, the DOD can make a concerted effort to obtain accurate budget projections. Budget requests are prepared using more realistic inflation rates based on Department of Commerce estimates. In several cases, the DOD has budgeted additional funds as a result of more realistic estimates. Further, DOD management believes it can improve the quality of its cost estimates and takes steps to do so. Also, DOD management believes it can improve budget execution through improved cost monitoring and control of defense systems costs. Further, DOD has improved the training received by officials responsible for cost control and is recognizing with appropriate awards program managers who successfully demonstrate effective monitoring and control of costs. Finally, DOD management reviewed the policies and procedures regarding cost/schedule control system criteria to determine if it could use this management tool in a better way.

Improved Support and Readiness

The DOD initiated a more thorough job of planning for the future logistical support of its new systems and equipment. In the past, new defense systems were sometimes fielded without sufficient spares and repair parts to keep them operating for an extended period. In 1983, the original contracts for systems and equipment included provisions for full initial support packages

and arrangements for an uninterrupted supply of replenishment parts. In addition, the design specifications for all new systems and equipment were making reliability and ease of maintenance top priority criteria.

Enhanced Competition

Enhanced competition presents some of the greatest challenges and perhaps the greatest opportunities for holding down costs. Every American is aware of the advantages of competition in a free economy – it encourages risk-taking, keeps down costs, and speeds innovation. Unfortunately, it is not always easy to foster competition. Usually, several contractors compete for a research and development contract. Once one of them gets the original contract, he develops the know-how and a head start that gives him an almost unbeatable advantage in contracting for production. The "competition," knowing this, may not bid. Often, the DOD has had to pay for competition, offering seed money to keep other contractors involved in the production of major defense systems. In most cases, the DOD has tried to maintain a second source, which would assure future competition as well as the availability of reliable substitutes in case a manufacturer was unable to meet DOD requirements.

On June 27, 1984, the House and Senate approved the "Deficit Reduction Act of 1984," a measure that included bold, new provisions regarding competition in contracting and bid and protest procedures. The provisions were:

– Place competitive negotiations on a par with formal advertising

– Significantly limit the use of noncompetitive procedures

– Establish a uniform $100,000 threshold for requiring certification of cost or pricing data

– Establish competition advocates in each agency and each procuring activity

– Provide an alternative forum for resolving bid protests involving automatic data processing equipment

– Codify and expand the current GAO bid protest procedures.

A policy letter setting limits on the use of sole source contracts was issued March 6, 1984 by the Office of Federal Procurement Policy (OFPP). The policy took effect with the issuance of FAC 84-3 on June 29, 1984.

Chapter 63

Defense Systems Acquisition Review Council

The DSARC is the top level DOD corporate body for defense systems acquisition. It provides advice and comments to the SECDEF following Milestone I and II reviews of defense system projects and following special project reviews. Upon the request of any one of its members, it could meet to consider a significant issue at any point in the acquisition process for any defense system. The SECDEF could issue an SDDM with or without benefit of a recommendation of the DSARC through the DAE.

As a result of issuance the Office of Management and Budget Circular Number A-109 in 1976, the DDRE, later the Under Secretary of Defense for Research and Engineering (USDRE), was appointed the DAE. As both the DAE and chairman of the DSARC, he is the principal advisor and staff assistant to the SECDEF for the acquisition of defense systems and equipment. The USDRE also serves as the DAE in accordance with implementation of the DOD Acquisition Improvement Program.

A list of the permanent numbers of the DSARC is shown inset in Figure 7. The Service Secretaries were added to the list of permanent members. Principal advisors to the DSARC were appointed to make recommendations in areas like acquisition strategy, producibility, NATO affairs, defense policy, threat assessment, test and evaluation, cost and logistics support. These advisors attend a DSARC meeting only at the invitation of the DAE.

Implementation of the DOD Acquisition Improvement Program requires that the Services be able to assure the DSARC that sufficient resources existed in the FYDP to execute the project as planned. The DSARC reviews individual projects at significant milestones to determine readiness to proceed to the next phase. Detailed review of the financing is accomplished by DRB, which includes the DSARC members. The DRB considers all projects within a resource allocation framework; therefore, the lack of an explicit resource commitment during the DSARC processing does not cause the problem (disconnect) it has in the past.

In March 1982, in a cover letter to a revision to DOD Instruction 5000.1, then Deputy Secretary of Defense Frank C. Carlucci directed DOD components to implement the revision, incorporating appropriate actions from the DOD Acquisition Improvement Program. This revision to the directive emphasized the following with respect to defense systems acquisition reviews:

—Achieving program stability through:

—Preplanned product improvement vs. new state-of-the-art program starts.

—Realistic program funding at program initiation and projected in the funding documentation.

—Emphasis on a DOD component-approved acquisition strategy throughout the acquisition process.

—Delegating program responsibility, decision-making, and accountability to the lowest organizational levels (decentralization). Program decisions made by line officials above the PM were to require documentation with appropriate accountability.

—Minimizing the acquisition time, including elimination or combination of program phases (with SECDEF approval).

—Tying the defense systems acquisition review process to resource allocation, or the PPBS process by addressing program affordability at program initiation and throughout the acquisition cycle. The Services were to prioritize their programs and identify resources they were willing to commit during design, development, production, test and evaluation, deployment and support.

In mid-1983, the author conducted a research effort to obtain insight into the personalities and issues that had influenced in DSARC operation since its inception. The principal perceptions of the 31 people contacted, without any attempt to prioritize the perceptions were:

—There is a general feeling of acceptance of the defense systems acquisition review process.

—The formation of a DRB was desirable and timely.

—The defense systems acquisition review process provides clear, programmatic milestones that place an element of discipline on program managers.

—The defense systems acquisition review process should not serve as a substitute for other DOD functional activities. For example, the DSARC principals should not conduct functional oversight responsibility during the review process. The activity should be handled through normal daily operations within the OSD.

—The DSARC has not acted like a "Board of Directors," although it has the appearance of such a board.

—The DSARC principals do not always have time to complete their "homework" before a DSARC meeting because of other pressing demands for their time.

—Monitoring his area of concern on more than 35 to 40 major programs is not a manageable workload for any DSARC principal.

—The DAE management style changes with each new DAE and this impacts the process.

—The SECDEF decisions are not taken to be binding budget decisions. For example, staff members who did not "carry the day" during the review process are able to open any aspect of a specific program for discussion during the PPBS cycle.

—The DOD component staffs seem to lack a cooperative spirit when the PM is striving to meet program objectives. The staffs appear to have "hidden" agendas.

—Through the years, the DOD components have sensed tighter control by OSD on major programs.

—The DOD must demonstrate responsibility for acquisition management to the Congress. A great deal of DOD action is a reaction to congressional action, or threat of action.

—The changing DSARC procedures with successive administrations have made it difficult to efficiently manage programs spanning seven years or more.

—The SDDM sometimes contains items not covered in the DSARC review, especially when document issuance is delayed.

—A "macro" analysis of the program affordability is missing from many reviews.

—Items not expected to receive DSARC approval are not presented for consideration/action.

—There is not common method for effectively closing out a program.

In analyzing the 16 selected programs, emphasis was placed on review of such documents as DCPs, SDDMs, Selected Acquisition Reports (SARs), and other program data relative to the program milestones and reviews. Data gathering was conducted at four levels; namely, OSD staff, Service staff, material command and program management office. Detailed information setting forth specific experience on the selected programs is presented in an article by David D. Acker published in the *Program Manager* and based on the information gathered by Information Spectrum, Inc.

Unfortunately, it was difficult to judge the findings as either positive or negative because criteria to measure effectiveness had never been developed. What might be considered positive to one DAE may not be considered so by another DAE because of differences in management style. Consequently, the findings summarized here are given without judging them to be either positive or negative, although, in some cases, such a judgment may seem to be obvious.

1. Administrative control of the defense system acquisition review process has been inconsistent.

– There has been a wide variation in the timing of the Secretary of Defense decision after the DSARC review.

– The method of documenting DSARC recommendations and SECDEF decisions has not always been in conformance with published instructions.

– Preparation and submission of the DCP is not always timely.

2. The DSARC has not ensured that:

– Program content and technical parameters are adequately defined before program initiation

– Program changes are adequately controlled.

3. Monitoring of cost, schedule and performance threshold compliance has not been consistent from program to program.

4. The greatest impact of the defense system acquisition review process usually occurs during preparation for the reviews rather than at the DSARC reviews.

5. The OSD staff actions during preparation for a review appear to be unorchestrated. The milestone planning meeting, in its present form, is not effective in identifying key program issues.

6. The DSARC principals attend the DSARC reviews between 45 percent and 72 percent of the time; however, their functional areas appear to be adequately represented when they are absent. A heavy DSARC workload over a short time span tends to reduce the attendance of the DSARC principals. Also, reviews held during or just after changes in administration (after an election) increase the absences of DSARC principals.

7. The program management office workload increases during the period before and after a DSARC review. The large number of prebriefs is a major factor in the increased workload before a review.

8. External forces (i.e., the Congress, international agreements) can impinge on a program and preempt or override DSARC recommendations made to the Secretary of Defense.

9. It is difficult to establish contractual agreements and program schedules closely attuned to the DSARC decision-making process. This has been a continuing concern to program managers.

10. Multinational programs and joint programs have encountered procedural difficulties during the defense system acquisition review process.

The concept of a defense system acquisition review process for major defense systems programs appeared sound. Although the process has undergone maturation for 14 years before this year, the basic concept had not changed appreciably. The transition of a major program from one program phase to the next has been controlled according to instructions based on a clear and adequate OSD policy statement.

The defense systems acquisition review process has fostered decentralized management of the acquisition functions, an underlying philosophy of Packard. Further, the milestone reviews have instilled a sense of discipline into the management of every major defense system program.

The defense system acquisition review process and procedures are effective, but not efficient. The failure of the process to provide early identification of critical issues is a weakness: On many programs, key issues are determined late in the coordination process – sometimes one or two weeks before a DSARC review.

The conduct of the defense systems acquisition review process on a specific program may not be in conformance with DOD directives/instructions. For example:

– A breach of threshold on one program may not be processed in the same manner as a breach on another program.

– Milestone review actions have not been consistent from one program to another.

– Previous SECDEF decisions have been modified without benefit of the DSARC review process; i.e., sometimes the OSD staff has modified or revised SECDEF decisions set forth in the SDDM or PDM without the benefit of a DSARC review.

A major factor in program management office workload, and in the length of preparation time for milestone reviews, is the large number of prebriefs requested by the Services. The need for so many prebriefs should be questioned by Service Secretariats.

Substituting other members of management for the DSARC principals at DSARC reviews detracts from Packard's concept of deliberation among senior members of management before a program milestone or major program decision.

There is a need for clearly-defined program baselines. The DCP, as originally conceived, was the document that served as a "contract" between the SECDEF and the Service(s) for the acquisition of a specific defense system. The DCP was updated following each DSARC review. Also, yearly reviews of the "contract" ensured that changes caused by a PPBS action, the Congress, or other activities were documented in the DCP. The PDM used today has not satisfied this function.

Finally, the functional responsibilities of the DSARC and the DRB are sufficiently different to warrant the continuance of their organizational separation. The DSARC looks

vertically at each program to ensure it is performing within the fiscal constraints of the FYDP, whereas the DRB looks across programs.

Clearly, better decisions have been made on defense systems programs because the people who have knowledge and expertise of each program have contributed recommendations along the pathway to each decision. However, conflicts as to approach have occurred at times because of the diverse interests of the members of the reviewing body – the DSARC. Normally, the DSARC chairman has ensured that each recommendation submitted to the Secretary of Defense has been a product of the deliberations of the DSARC members. In the end, the Secretary of Defense has made the major program decisions. After such decisions have been made, everyone concerned with the program has been expected to abide by them. This has to be judged as an effective process.

Chapter 64

Emphasis on Spare Parts and Their Provisioning

In the early 1980s, after a series of incidents involving spare parts and their provisioning, greater emphasis was placed on competition in buying spares. Almost every horror story that appeared in the press was based on information that surfaced from DOD's audits and investigations — audits undertaken because DOD management wanted to determine the nature and full dimension of the spare parts problem before applying solutions.

Spare parts reform, resulting from perceived and actual over-pricing of spares, is a complex and massive management challenge. The spares inventories for major defense systems contain almost four million different items, many of them low-cost bolts and washers. It is difficult to identify the spares and to keep track of their prices. During 1983, Secretary of Defense Caspar W. Weinberger laid down some firm policies, designed to institutionalize improvements in the procurement of spares and to gain firm control over their pricing. The policy reforms included writing tougher contracts, challenging apparent high prices, obtaining refunds, continuing audits, and enhancing competition.

At the direction of the SECDEF, the June 1983 DAR Supplement No. 6 entitled, "DoD Replenishment Parts Breakout Program," was issued pursuant to the authority contained in DOD Directive 5000.35. The Supplement replaced the Joint Regulation entitled, "DoD High Dollar Spare Parts Breakout Program," dated March 1969. The Supplement was issued pursuant to DAR 1-103.6 for the guidance of DOD personnel engaged in acquisition (including technical support thereto) of centrally-managed replenishment parts for defense systems and equipment. It prescribed a uniform policy and procedures for screening and coding parts. Contracting officers will be provided with summary information regarding technical data and sources of supply to meet the government's minimum requirements. This information is assisting contracting officers in selecting the method of contracting, identifying sources of supply, and making other decisions in the preaward and award phases of a defense system program, with consideration for established parameters of system and equipment integrity, readiness and opportunities to competitively acquire parts. The procedures are based on the application of sound management and engineering judgment when determining the feasibility of acquiring parts by competitive procedures, and overcoming or removing constraints to breakouts identified through the screening process.

In the past, the DOD has often rewarded employees and contractors for speed and ease of procurement, rather than low price. Not surprisingly, the DOD found that by 1980 it was buying competitively only six percent of the total dollar value of its aircraft engine spares. By the end of 1983, the DOD had almost tripled the share of aircraft engine spares it bought that way; therefore, the DOD decided to continue increasing competition for aircraft spares and for all its spares accounts.

With an inventory of 3.4 million spare parts and other secondary items worth $52.7 billion, the Deputy Secretary of Defense said it would take some time to uncover and correct problems that existed for decades. In late July 1983, Defense Secretary Weinberger announced a 10-point program on spare parts procurement reform. The DOD instituted a phased program to change the entire system by which it bought spare parts. Increased competition became institutionalized.

Competition advocates were established at each purchasing agency with a charter to challenge the comfortable old ways of doing business. The advocates reviewed contracts in areas where competition had been lacking, and they knocked down any barriers to open competition where they found them.

For the first time, the Services wrote contracts ensuring spares were purchased competitively. The new engines for future models of the F-15 and F-16 fighter planes were a good example of this effort. Pratt & Whitney and General Electric competed for the rights to build those engines. To increase future competition for spares, their bid offers had to identify the manufacturer of each spare part on the engine so that in the future the Air Force would not be forced to buy spares through the prime contractor. The winning contractor had to guarantee that the technical information and specifications required to obtain competition for subsequent spare parts procurements would be complete and up-to-date whenever needed. Finally, the bidders were required to submit plans showing how they would develop two or more qualified subcontractors who would remain available to compete for production of the 30 replenishment spares with the highest procurement value. Because the high-value parts comprised about 80 percent of the value of the engine, it was possible to focus DOD efforts on gaining competition for the remaining 20 percent, which included thousands of low-cost items. This is where the gross examples of overpricing are found.

Chapter 65

Focus on Warranties

Section 794 of the FY 1984 Defense Appropriations Act (Public Law 98-212) stated that no funds "may be obligated or expended for the procurement of a weapon system" unless the contractors for the system provide certain written guarantees. The law requires that a defense system and each component thereof conform to the stated performance requirements and the contractor guarantee the system to be free from all defects that would cause it to fail. If a defense system or component fails, the contractor "will bear the costs of all work promptly or repair or replace such system or component as may be necessary to achieve the required performance requirements." If the contractor fails to repair or replace the parts promptly, the contractor will "pay the cost incurred by the United States Government in procuring such parts from another source."

The purpose of the new DOD guidance was to supersede the guidance in DAR 1-324. The practice of applying warranties when appropriate in competitive firm-fixed-price type contracts was modified by the statutory requirement to include guarantees in all procurements that qualify, regardless of whether competitive or not, and regardless of contract type. The provisions of the law require guarantees that reverse the longstanding DOD policy of using warranties selectively at the subsystem and component level rather that at the systems level.

In December 1983, then Deputy Secretary of Defense, William H. Taft IV, issued to the Services a 90-day general waiver of the warranties provision contained in the FY 1984 Defense Appropriations Act. At the end of this period, DOD issued guidance to implement the controversial warranties provision.

The DOD officials moved reluctantly to carry out the provisions of the law because they believed the requirements would substantially increase contract costs as prime contractors, subcontractors and vendors tried to protect themselves against greater risk. The SECDEF noted there were selective cases in which DOD could guarantee performance using warranties, such as in the award for improved fighter engines. However, he also noted that warranties might end up costing the DOD more money because contractors raised their prices to cover potential liabilities in the out-years. Sen. Mark Andrews (R-N.D.) believed warranties could be written to ensure that defense systems work, and it is cheaper in the long run and better for national security to have defense systems that do work. The SECDEF shared the latter viewpoint but, in its 1985 budget request, DOD asked the Congress to repeal the warranty requirements that had been included in the FY 1984 defense appropriations measure.

Chapter 66

Review and Oversight

Halting fraud may offer the DOD an opportunity to recoup a small part of its expenditures; however, far more savings can be gained through management reform. Good management procedures work if someone checks to ensure they are being followed.

To direct the work of the auditors and investigators who normally conduct the DOD campaign against fraud, waste and abuse, Secretary of Defense Weinberger created an Office of Review and Oversight shortly after he arrived at the Pentagon. More than 3,000 auditors in the Defense Contract Audit Agency aggressively review contract costs. Secretary Weinberger's personal interest in the review and oversight effort produced a high degree of cooperation between managers and auditors. In the past, many recommendations of auditors had fallen on deaf ears, but under the new approach, managers began working with them to weigh advice jointly and set timetables for resolving the problems that were uncovered.

Chapter 67

The Grace Commission

In 1983, President Ronald W. Reagan asked a group of well-known corporate and financial leaders to visit each department of the federal government and report back on how they could be managed more efficiently. Headed by Peter Grace, the President's private sector survey group did its work well. As a result of its study of defense acquisition and its management, it discovered there were areas where the DOD could profit from the experiences of private industry. The Commission found that although many management reforms were already under way, many of them would have to depend on the approval of the Congress before they could be implemented.

The Grace Commission made 275 recommendations in four reports addressed to the DOD. Paul Thayer, then Deputy Secretary of Defense, reported that the DOD agreed with about 70 percent of the recommendations. Unfortunately, about 80 percent of the savings estimates related to recommendations requiring congressional action. Because of a time and resource constraint, the Commission could only make gross estimates of savings. The savings turned out to be substantially overstated. They did not consider initial investment or offsetting costs.

Chapter 68

Federal Acquisition Regulation

Between July 1983 and July 1984, the impact of congressional actions and GAO audits on the defense acquisition process has become more pronounced than ever before. For example, recently the Congress changed more than 3,200 line items in defense programs! The 535 elected officials and 20,000 staffers have been responding to their obligation to "provide for the common defense" by showing increased concern about the effectiveness of the acquisition process. This makes life very difficult for DOD management – management already dealing with more than 4,000 laws concerning acquisition that are on the books. The laws concerning the acquisition (often referred to as "procurement") of defense systems include what one might call a laundry list of economic-dole and social-welfare programs to be imposed on defense contractors.

From July 1983 to July 1984, there were more than 180 proposed laws affecting the defense systems acquisition process. The new laws, when passed, became effective at the same time DOD and civil agencies were expending additional effort to implement the FAR (the standardized Federal Acquisition Regulation), effective April 1, 1984.

The FAR and the DOD FAR Supplement, which augmented it, replaced the Defense Acquisition Regulation (DAR). The FAR was to be followed for all new solicitations. The DOD FAR Supplement, containing approximately 1,100 pages, is not a stand-alone document and it has to be used in conjunction with the FAR. Federal Acquisition Circulars (FACs) and Defense Acquisition Circulars (DACs) are published to update the FAR and DOD FAR Supplement. The first change to the DOD FAR Supplement was DAC 84-1. Later DACs were numbered in the same series; e.g., 84-2, 84-3. A number of existing DAR appendices, manuals and supplements will continue to be used until they are updated, cancelled or superseded.

Chapter 69

Test and Evaluation

Because of perceived "poor" performance of defense systems during operational test and evaluation, the Congress ordered the creation of an independent test organization (Section 111 of the FY 1984 DOD Authorization Act (PL 98-94)) that would report directly to the SECDEF rather than to the USDRE. The charter for the new test organization was written and a new office was established. This change directly affected the policy set forth in DOD Directive 5000.3, "Test and Evaluation," and a revision was necessary. The new policy resulted in a longer testing period for DOD acquisition programs. The results of tests conducted under the supervision of the new office were submitted to the SECDEF as well as to the Congress.

The SECDEF found a qualified Director of Operational Test and Evaluation (OT&E) for the new office. The office had a staff of 16 — half military, half civilian. Close cooperation between the head of the office reporting to USDRE and the head of the office reporting to the SECDEF was required because any assessment of a defense system depended on all of the test results obtained — developmental and operational. In the first year, 10 defense system programs in low-rate production were scheduled for consideration for full-scale production. The new office focused its attention on these programs.

Chapter 70

Joint-Service Program Management

In a report to the Congress in the winter of 1983-1984, the Government Accounting Office (GAO) concluded that joint-Service programs failed because of the differences in technical and operating requirements in each Service, as well as poor program development and coordination. Although the GAO had been a strong supporter of joint-Service programs, when they would save money, the GAO learned that the concept had not been working. The GAO defined "successful" completion as a combined system operating in the field. Other factors that have limited the successful development of joint defense systems include doctrinal differences, such as the "not invented here" syndrome, the civilian-military polarity, and the continuing pursuit of Service distinction.

The GAO believes many of the problems being experienced in joint-Service programs stem from rigid Service positions on the system features. Once a joint program is ordered and an inter-Service committee is formed, long and arduous negotiations must be conducted to accommodate the needs of each Service in the combined system. Further, differences in doctrine and technical needs, organizational arrangements, standards, data requirements, manuals, provisioning, integration of training methods and test requirements lead to major problems. Inter-Service differences in nomenclature and interpretation make it difficult for the Services to negotiate joint-Service programs.

The GAO concluded that the Cruise Missile was a successful joint program. The success of this program was due to the actions of several sponsors who were key figures in the DOD, the White House, and the Department of State. At every crucial stage in the development of each type of cruise missile, high-level integration was necessary either to start or sustain it.

Chapter 71

Cost Growth

Defense system cost growth is not a new phenomenon. It has been studied many times.

Uncontained cost growth manifests itself in the presence of optimistic budgets at the beginning of programs, a lack of understanding of specific requirements, or constrained overall budgets. Cost growth tends to increase program instability because it leads to program cuts or stretchouts. During 1984, the problem was examined in detail by the DOD and various government, private and academic institutions. A number of approaches to halt cost growth were proposed, but many similar approaches had been tried before and failed.

In March 1984, the DOD reported to the Congress that, for the first time in 10 years, year-end costs for major defense systems had decreased. To maintain control over costs, the DOD is enforcing the presentation of realistic budget estimates and discouraging the past practice of presenting overoptimistic estimates.

Chapter 72

Award Fees for Tailoring Contract Requirements

The DOD decided to use award fees as a means of encouraging contractors to recommend ways to cut down the number of contract requirements. The DOD believed award fees would encourage contractors to cooperate in the selective application of contract requirements, including standards and specifications, so an item could be made better and less expensively. The effort, initiated in January 1984, envisioned that the bulk of the tailoring would take place in the demonstration/validation phase of a program. Initially, the concept was applied to 12 programs, including the Army's Pershing II Missile, the Air Force's Advanced Tactical Fighter, and the Navy's Amphibious Assault Ship (LHD-1).

Several documents were revised to reflect the new approach.

Chapter 73

Competition in Contracting

The Competition in Contracting Act (CICA), part of the Deficit Reduction Act of 1984, PL 98-369, was passed in August 1984 and became effective April 1, 1985. The background of events leading to the passage of this legislation is interesting. In the 1960s, design competition was introduced into the research and development phase of the acquisition of major defense systems. Contract awards were to be based on the application of detailed technical, cost, management and other stated evaluation criteria, in accordance with exacting source-selection procedures prescribed by DOD directive.

This design-competition approach, as applied to the acquisition of major systems, was codified as a government-wide policy by OMB in Circular A-109 of April 5, 1976. Under the new approach for purchasing major systems, agencies were to "express needs and program objectives in mission terms and not equipment terms to encourage innovation and competition in creating, exploring, and developing alternative system design concepts."

As implemented by the Defense Department, competitive procurement of major systems was rarely, if ever, conducted beyond the design and prototype phase to deter cost growth and cost overruns. Contracts for the production of major defense systems were routinely awarded to the winner of the development or design competition. Follow-on contracts for further production also were awarded without product or price competition, because effective competition generally was no longer available.

In major system acquisitions, the bulk of the funding was for production rather than for design and development. Thus, the noncompetitive character of the production procurements accounted for the high dollar proportion of noncompetitive awards to total awards each year.

In the 1980s, efforts were started to extend competition to the production of major defense systems through the use of dual sourcing and second-sourcing techniques. The engine program for the Air Force F-16 fighter was an example of the dual sourcing approach, with incremental production lots of the two different engines involved to be competed between General Electric and Pratt & Whitney on a fixed-price basis.

The passage of this Act was the precursor to a totally new scheme of congressional regulation enacted amidst the well-publicized disclosures of procurement waste, particularly in excessive prices for military spare parts.

The Competition in Contracting Act, repealed most of the predecessor Armed Services Procurement Act of 1947 and the procurement provisions of the Federal Property and Administrative Services Act of 1949 and in effect, started anew. The principal thrust of CICA was to require competition in contracting by specifying procurement needs and developing

specifications "in such manner as is necessary to obtain full and open competition" and by narrowing the circumstances in which agencies may use procedures other than the competitive procedures mandated by the Act to obtain full and open competition.

The introduction and expansion of multiple elements of technical and cost competition, in order to reach the wide range of procurements unsuited to fixed-price contracting awarded by formal advertising, promised to reduce the high dollar value of sole-source awards, particularly in the production of major systems. Unfortunately, these new forms of competition were unavailing when quantities and rates of production were not sufficient to sustain at least two sources of high-cost items requiring substantial investment in facilities, special tooling and highly skilled personnel. Nevertheless, the new statutes represented a significant step forward in increase competition.

Chapter 74

Computer-Aided Acquisition and Logistics Support

In the early 1980s, the need for major improvements in supportable defense system designs was recognized, as was the need to improve the accuracy, timeliness and use of technical information. A DOD-Industry Task Force on CALS — a computer-aided acquisition and logistic support group — was formed to study the generation, access, management, maintenance and distribution of the technical data associated with defense systems. The data included information available on technical drawings, in the definition of products, and the data resulting from logistic support analysis, technical plans and reports, technical manuals, training manuals and associated materials, and data available in feedback from the operation of defense systems.

The Deputy Secretary of Defense, William H. Taft IV, issued a statement to the Secretaries of the military departments and the Director, Defense Logistics Agency, in September 1985 approving the recommendations submitted by the DOD-Industry Task Force on CALS. The recommendations made by the Task Force were designed to achieve major improvements in supportable defense system designs, as well as reduce cost, improve accuracy, timeliness, and quality of defense systems and their supporting technical data.

According to the new handbook - Military Handbook 59 "Department of Defense Computer-aided Acquisition and Logistic Support (CALS) Implementation Guide" dated 28 September 1990 - the purpose of CALS is to improve both industry and DOD productivity and quality, thereby improving supportability, military readiness, and combat effectiveness. The handbook states that the objectives of CALS are:

a. To accelerate the integration of design tools such as those for reliability and maintainability into contractor computer-aided design and engineering systems as part of a systematic approach that simultaneously addresses the product and its life cycle manufacturing and support requirements.

b. To encourage and accelerate the automation and integration of contractor processes for generating weapon (defense) system technical data in digital form.

c. To rapidly increase DoD's capabilities to receive, store, distribute, and use weapon (defense) system technical data in digital form to improve life cycle maintenance, training, and spare parts reprocurement, and other support processes.

A variety of automated systems are utilized by defense system contractors working as a production team to enter, update, manage and retrieve data from data bases associated with specific acquisition programs. Many of these systems are incompatible with one another as well as with similar systems employed by the government to receive, store, process and use delivered technical data. The functional capabilities supported by these diverse systems vary greatly. Data

created in one functional process is often manually reentered or recreated in subsequent functional processes. This, of course, introduces errors and increases costs.

The handbook states that the near term goals for CALS implementation are attainment of increased levels of interfaced, or integrated, functional capabilities, and specification of requirements for limited government access to contractor technical data bases, or for delivery of technical data to the government in digital form. The specifications are designed to comply with widely-accepted commercial standards.

The longer-term goal of CALS is integration of industry and DOD data bases to share common data in an Integrated Weapon System Data Base (IWSDB) structure that is implemented through Contractor Integrated Technical Information Systems (CITIS) and government technical information systems. Data deliverables from, or government access to, specified segments of CITIS data will be explicitly required in future contracts and developed in accord with CALS standards and procedures. The technology to accomplish this will be incrementally implemented as it is developed and proven. Industry and the DOD will be implementing a mixture of current and emerging technologies throughout the 1990s.

The handbook applies to programs for acquisition and support of defense systems and related major equipment items (including support systems) to which DOD Directive 5000.1, DOD Instruction 5000.2, or DOD Directive 5000.39 apply. Policy guidance issued by the Deputy Secretary of Defense on August 5, 1988, required acquisition managers to evaluate CALS capabilities in source selection decisions and to implement cost-effective CALS requirements in contracts for defense systems and related major equipment items.

CALS Strategy

To achieve CALS benefits, a phased CALS strategy was established by a team consisting of representatives from the Office of the Secretary of Defense (OSD), the military departments, the Defense Logistics Agency (DLA) and industry. the key elements of the strategy are:

—*Standards and integration requirements*. Accelerate the development and testing of standards for digital technical data interchange and integrated data base access

—*Defense system applications*. Implement CALS standards in defense system contracts and encourage industry modernization and integration

—*Technology development and demonstration*. Sponsor the development and demonstration of the necessary technology for integration of technical data and processes in high-risk areas

—*DOD systems*. Implement CALS standards and integration requirements in DOD planning and infrastructure modernization programs. Infrastructure is the underlying framework of organizations, systems and processes within which DOD operates.

CALS Concepts

The CALS system of systems approach consists of these key elements:

— Industrial systems (i.e., design, manufacturing and customer support)

— Government systems (i.e., acquisition and logistic support)

— Interfaces between industry and government

— Interfaces within industry among prime contractors, subcontractors and vendors.

Information can pass between these systems, in both directions, in the form of documents, processable data files, and interactive access to data bases.

CALS Standards

Three broad groups of requirements documents constitute the CALS interchange standards. They are:

— *Functional Standards.* Military standards, military specifications, and Data Item Descriptions (DIDs) that define functional processes, data requirements, data creation procedures, and the content and format of data products.

— *Technical Standards.* Federal standards, military standards, military specifications, and other relevant conventions (including their associated DIDs) for the management, formatting and physical media or telecommunications exchange of text, graphics, alphanumerics and other forms of digital data.

— *Data Standards.* Data dictionaries that provide rules governing data element definitions, data relationships, and requirements for data integrity and consistency. The standards also include file structure definitions, index keys, and other descriptive information needed for access to data bases.

Functional Integration Requirements

A major CALS objective is a standardized approach for integrating technical data use within a defense system program. Functional integration requirements are contractual tasks used in statements of work (SOWs) or incorporated in functional standards articulating the required contractor capabilities for the integration of data systems and processes. These requirements specify the integration of design, manufacture and support processes, as well as other elements of concurrent engineering, for the performance of DOD contracts. They also establish the means by which contractors demonstrate the capability to access and share data bases among and between functional areas.

CALS Requirements in Defense System Acquisition

Policy guidance issued by the Deputy Secretary of Defense required that plans for new defense systems and related major equipment items include use of the CALS standards published in MIL-STD-1840A "Automated Interchange of Technical Information," and supporting military specifications. Specifically:

- For systems entering full-scale development or production prior to September 1988, acquisition managers were required to review specific opportunities for cost savings or quality improvements that could result from changing paper deliverables to digital delivery or access using the CALS standards.

- For systems entering development after September 1988, specific cost and schedule proposals were to be obtained for: (1) integration of contractor technical information systems and processes, (2) authorized government access to contractor data bases, and (3) delivery of technical information in digital form. The proposals were to be given significant weight for their cost and quality implications in source-selection decisions. The CALS standards were to be applied for digital data deliverables.

CALS Requirements in Automated Data Processing System Acquisition

The CALS implementation involved the participation of defense system acquisition managers, and government and industry automated data processing system managers. Acquisitions of future computer hardware, software and telecommunications were required to address CALS data interchange and access requirements. The key to supporting these requirements was an open architecture that could cost-effectively support future data interchange and access needs. The policy guidance provided by the DEPSECDEF required DOD components to program for automated systems to receive, store, distribute, and use defense system technical data in digital form in accordance with the CALS standards.

Although the CALS program is still in the preliminary stages of operations, as the cumulative impact of integration and infrastructure modernization is realized in DOD and industry, more far-reaching changes will occur in the way functions are accomplished, leading to additional major savings. It is anticipated that the implementation of CALS will result in a lower defense system life-cycle cost, shortened acquisition lead times, and improvements in reliability, maintainability and readiness.

Chapter 75

The Packard Blue-Ribbon Commission

In June 1985, President Ronald W. Reagan, assailing defense contractor abuses as a blow to national security, named former Deputy Secretary of Defense David Packard to head a Blue-Ribbon Commission on Defense Management.

The Commission was asked to focus on the advisability of realignments in the organization of the DOD and on how to improve the workings of the bureaucracy that administered the department's defense systems procurement contracts.

"Weapons that don't work, exorbitant prices for spare parts, illegal payments, illegal charges and other evidences of a troubled situation" were not problems that originated in the Reagan Administration, Packard said after his appointment. He recalled: "I had to deal with the same problems when I was at the Pentagon 15 years ago."

In the recent past, Packard has counseled more flexibility in defense contracts, arguing that rigid specifications impede the communication needed between the Pentagon and its contractors. His view is held by other officials in industry as well as in some congressional quarters.

Spurred by a host of congressional reform initiatives, President Reagan chartered the Packard Commission to evaluate recent and new procurement reform proposals as well as organization and decision-making at the DOD. Also, the Commission was called upon to study and report on how the Congress exercised oversight of the DOD.

President Reagan expected the greater part of the Commission's time in the early stages to focus on procurement issues. The President wanted those issues reported to him by the end of the year. An interim report was submitted in the spring of 1986 and the final report was submitted in June 1986.

The Commission's charter focused on the possibilities for improving the internal methods and procedures used in making defense decisions, including the Joint Chiefs of Staff and command procedures.

The impetus to create the Presidential Commission came from President Reagan's broad concern about the maze of defense contract procedures and regulations that had accumulated over the past 40 years. That concern was echoed by the ranking Democrat on the Senate Armed Services Committee, Sen. Sam Nunn (D-Ga.) who, in endorsing Packard's appointment, said: "It may be we need to repeal some existing rules and regulations, and give more flexibility."

President Reagan stated that his decision to form the Commission was based on the recommendation of Secretary of Defense Caspar W. Weinberger, who was lauded by the President for pursuing management reform by going "straight for the skeletons in the closet, and there were many."

The four member Commission identified by President Reagan on July 15 was composed of people with extensive experience and national reputations in commerce and industry, as well as people with broad experience in government and national defense.

The work of the Commission was based on some of the suggestions received by President Reagan from Representative William Dickinson (R-Ala.), the ranking Republican on the House Armed Services Committee. Dickinson met with the president on 1 April 1985, and twice afterward to express his thoughts on the formation and role of the Commission.

In accordance with its charter, the Commission studied issues surrounding defense management and organization, as well as policies and procedures. In the area of acquisition, the Commission reviewed the procedures for developing and fielding defense systems and equipment incorporating new technologies in a timely fashion. In addition, the Commission studied and made recommendations concerning congressional oversight and investigative procedures related to the DOD. At the outset, the Commission devoted its attention to the procedures and activities of the DOD associated with the procurement of defense systems and material.

During 1986, the Commission reviewed the adequacy of oversight by the SECDEF and the decision-making structure within the OSD. The organization of the Joint Chiefs of Staff, and the unified and specified command system were investigated. Procedures for developing and fielding military systems that incorporate new technologies were reviewed. Finally, the Commission studied the Senate and House oversight and investigation of the OSD, and, based on the findings, recommended methods to stabilize defense system program funding.

Recommendations of the Commission for improving DOD procurement were submitted to the President and the SECDEF on December 31, 1985. An interim report on the nonprocurement aspects of the study were presented to the President in late March 1986, and the final report was submitted by the end of June 1986.

Status of Acquisition-Related Packard Commission Recommendations

The Conference Report to the FY 1989 DOD Authorization Act (Report 100-989) directed the USD(A) to assess the effectiveness of the Department's implementation of the Packard Commission recommendations.

By "report time" considerable progress had been made to implement recommendations by the Packard Commission to improve acquisition policies and practices in the DOD. Emphasis had been placed on maintaining greater stability and savings through purchasing at economic production rates, using multiyear contacting for procurement programs, and baselining major

weapons programs to facilitate management oversight. Specific actions in these areas included the following:

—Economic production rates are contributing to stability and savings by allowing a contractor to take advantage of tooling and plant capacity to produce additional units of a system at a cheaper unit cost. Of 34 major defense acquisition programs in the DOD FY 1989 amended budget submission, 30 were planned for procurement at or above the minimum economic production rate.

—Multiyear contracts for production of defense systems allow contracts to plan and invest with more confidence and enable them to buy more economic order quantities of many components of the system. Total savings from multiyear procurements from FY 1982 to FY 1989 will exceed $7.5 billion. In the FY 1989 DOD budget, seven multiyear candidates were approved by the Congress with an estimated total savings of $942 million.

—The acquisition baseline serves as a formal agreement between the OSD and Service leadership to manage the program based on specific performance, schedule and cost objectives. Deviations from these objectives trigger a review to either restore the program to the baseline parameters, revise the baseline agreement, or cancel the program. The policy has been improved to link closely the establishment of the program baseline with major milestone reviews. The Under Secretary of Defense for Acquisition, USD(A) approves the baselines giving high priority to the efficient implementation of this policy.

The DOD submitted its first two-year (FY 1988-89) budget in January 1987. The two-year budget was a serious effort to promote stability and consistency in defense budgeting. Regrettably, the Congress did not act on the two-year budget. The contribution of this recommendation to program stability had to depend largely on the cooperation of the Congress. The DOD will continue the two-year cycle of planning, programming and budgeting defense requirements, and will submit a biennial defense budget for FY 1990/FY 1991.

The DOD is seeking to achieve the important objective of excellence emphasized in the Packard Commission recommendations by embarking on total quality management (TQM). This initiative emphasizes continuous process improvement in every facet of acquisition. It requires top management to seek fundamental change in how the acquisition community views product quality. A DOD posture statement on quality will be issued outlining the principles and guidelines for implementation of TQM. The DOD policy will ensure TQM measures are applied in acquisition planning and throughout all aspects of program execution. As the quality-first concept inherent in TQM is shown to benefit the defense sector, it will help lead a renaissance of quality throughout the United States.

More action is needed to implement the Commission recommendation to enhance the quality of DOD acquisition personnel. This includes improving the senior-level appointment system — simplifying financial disclosure statements, enacting legislation for an alternative

personnel management system based on the China Lake model – simplified classification and salaries reflecting market conditions, and better training for all acquisition personnel.

The Administration, through the Office of Personnel Management (OPM), recommended legislation to the Congress that adopts much of the personnel management system based on the China Lake model. The legislation was not enacted in the 100th Congress, and is expected to be recommended again. Additionally, at the request of DOD, OPM established a requirement for 24 hours of business-related courses for contracting personnel.

Chapter 76

Acquisition Streamlining

Acquisition streamlining involves the evolutionary development and optimization of acquisition program requirements for cost-effective contracts. It involves taking action to preclude or eliminate noncost-effective requirements in design, development and production. The primary actions that can be taken are:

- Specify requirements in terms of mission performance
- Preclude premature requirements
- Tailor requirements
- Limit the contractual applicability of referenced documents.

Such streamlining can be augmented by utilizing a contractor's ingenuity and experience to arrive at cost-effective design approaches while the decision-making authority of the government program manager remains intact on a new program. The program manager must place sufficient emphasis on streamlining during the development of mission performance requirements for a new defense system or equipment. The candidate specifications must be justified on a case-by-case basis. Department of Defense Directive 5000.1, dated March 29, 1982, supported this approach. It stated that "effective design...shall be obtained to the maximum extent practicable to ensure that defense systems are cost-effective and are responsive to mission needs."

In the early months of 1985, OSD placed increased emphasis on acquisition streamlining because it was vital that both solicitations and contracts be "streamlined." When streamlining takes place, both counterproductive and overspecified requirements are eliminated.

Deputy Secretary of Defense William H. Taft, IV, took the lead in trying to reduce overspecified and noncost-effective acquisition requirements. In a memorandum dated November 8, 1984, he expressed concern about the high cost of acquisition requirements, particularly in the defense systems that have been fielded.

On December 4, 1984, Taft issued another memorandum assessing what had happened as a result of his initial memorandum pertaining to fielded systems. The second memorandum identified where to place the emphasis to address the issue properly.

Deputy Secretary of Defense Taft said there were more than 40,000 military specifications and standards in the Defense Standardization and Specification Program, and "there are literally millions of DoD acquired contractor-generated item drawings which might contain problems in terms of over-specified requirements for items to be procured." Considering the magnitude of

these requirements documents, an accurate assessment of the number of specifications and drawings requiring refinement was not economically feasible.

Five basic causes of the problem were identified. They were:

1. An overly conservative design approach

2. Failure to challenge requirements during design and development

3. Buying drawings that have been outdated because of new technology or advances in operational requirements

4. Inadequate technical data with which to access specifications

5. Inadequate resources to staff material reviews.

Deputy Secretary of Defense Taft identified several areas where action could be taken. He requested the following actions be taken:

- Challenge requirements in specifications and standards

- Conduct technical reviews and assess reasonableness of cost

- Conduct value engineering throughout the life cycle of a defense system program

- Upgrade the technical review capability of any organization that is responsible for procurement of replenished items

- In program management education, present techniques for assessing the reasonableness of the design and production approaches, because they affect the cost of a defense system.

On December 5, 1984, a memorandum on the subject of eliminating noncost-effective contract requirements was issued by DEPSECDEF Taft. In this memorandum, he said that the most significant long-term solution to eliminating these requirements was adherence to the approach set forth in the DOD streamlining, initiative (the DEPSECDEF memorandum dated January 11, 1984). The approach called for identifying the most cost-effective contract requirements during the early design stages. In the December 5 memorandum, DEPSECDEF Taft asked that the Services accelerate and intensify the acquisition streamlining according to this initiative.

On December 6, 1984, DEPSECDEF Taft announced that acquisition streamlining would be one of the top initiatives during the current administration. The emphasis within OSD would be on working with the advocates to expand the number of programs, finalizing DOD policy and

guidance, developing parameters for measuring effective streamlining implementation, coordinating a DOD-wide training program, and developing incentives for DOD personnel.

The OSD focal point for the acquisition streamlining effort was Dr. Richard A. Stimson, OUSDRE. As such, Dr. Stimson worked with the military departments, through streamlining advocates, to finalize the streamlining initiative. He provided periodic status reports to the DEPSECDEF in March 1984. These reports contained the plans and accomplishments of the military departments in acquisition streamlining.

Acquisition Simplification

The Under Secretary of Defense for Acquisition initiated several programs to simplify the acquisition process and implement the Packard Commission Recommendations.

The Pilot Contracting Activities Program (PCAP) gave waiver authority to selected activities within the military services and defense agencies to test innovative contracting practices and recommendations for change in the acquisition process. The PCAP program is a bottom-up approach to identifying impediments in the acquisition process. The overall initiatives can be characterized as increasing contracting officer authority and streamlining the contracting process.

The Bank Card Program is a simplified small purchase procedure for acquisitions under $25K. Bank Cards are "credit card" type methods of buying small dollar value items normally purchased through imprest fund or SF 44 transactions. Military departments tested the Bank Card Program and initial results showed a reduction in acquisition lead time and administrative paperwork.

A study was completed of nearly 500 different regulatory requirements tied to dollar thresholds identified by the Packard Commission and DOD as potential areas for streamlining the Federal Acquisition Regulations (FAR) and the DOD FAR Supplement (DFARS). Phase I of the study evaluated 88 dollar threshold requirements of which 72 were administratively imposed. The study recommended 42 remain unchanged; 15 be eliminated entirely; 8 be retained but increased; and, in 7 cases, the threshold should be removed and replaced with guidelines. The Defense Acquisition Regulatory Council considered these recommendations for appropriate action.

Phase II of the study reviewed the remaining 366 thresholds of which 277 were administratively imposed. It recommended 42 threshold values be increased, 74 eliminated, 7 studied further, and 154 remain unchanged. The number of different thresholds was significant and affected the DFARS for which DOD had sole responsibility and other regulations, which were under the cognizance of the Civilian Agency Acquisition Council. The DOD was committed to evaluating recommendations affecting regulations under its cognizance and taking the action to implement needed changes.

An electronic publishing system was purchased giving DOD an on-line edit capability of the FAR and DFARS. The acquisition of advanced software will enable the FAR and DFARS to be virtually a desktop publishing system. This effort increased DOD's capability to make needed changes and disseminate them to the acquisition community more quickly and efficiently.

The Services and DLA completed a line-by-line review of their supplements to the FAR to delete, change or otherwise simplify unnecessary or overly-restrictive acquisition regulations. As a result of the review, the total line count of the regulations was reduced by approximately 30 percent with no degradation to regulatory guidance.

The DOD completed a rewrite of the Service Contracts portion of the FAR and DFARS. This section implemented the Service Contract Act and OMB Circulars A-76 (Commercial Activities) and A-120 (Consulting Services). A DAR case (88-68) was established that, when approved, would simplify, streamline and provide guidance to contracting activities who buy services.

Could cost, a new acquisition technique being tested within the Department, seeks to create the special challenge that a commercial marketplace poses; i.e., what could the cost and quality of the product be if we fundamentally change how we do business by eliminating nonvalue added work and concentrating on delivering the best quality product, on schedule, and at the lowest possible cost. Could cost include the ultimate extension and integration of other special acquisition techniques such as total quality management, should cost, streamlining and value engineering.

Actions Taken to Reduce Duplicative and Excessive Oversight

As a result of recommendations made by the Packard Commission and various legislated requirements, the USD(A) established a joint working group consisting of representatives from the offices of the USD(A), the Inspector General (IG), and the DOD Comptroller to address the duplication problem. Many of the actions taken by the Department to reduce duplication were the result of recommendations made by the joint working group.

Visits to Contractor Facilities

The FAR was revised on January 11, 1988, to specify that prospective visitors to contractor facilities were to provide advance information concerning the visit to on-site government personnel. This notification was for the express purpose of eliminating duplicative reviews, requests, investigations and audits relating to the functions delegated to contract administration offices. If the visit would result in reviewing, auditing or obtaining any information from the contractor related to functions that had been delegated to contract administration offices, on-site government personnel were to determine whether information adequate to fulfill the stated requirement had recently been reviewed by, or is already available within the government. If so, the prospective visitor would be referred to the government office where the information is located and the visit will be discouraged.

Authority of Contracting Officers

To eliminate the perception that contracting officers were not the final decision-making authority with respect to contractual matters, the DOD redefined the respective roles of the contracting officer and the contract auditor through a February 12, 1988, revision to DOD Directive 7640.2, "Policy for Follow-up on Contract Audit Reports." The Directive, as changed, recognized "the independent, decision-making role of the contracting officer and the financial advisory role of the contract auditor." The oversight role assigned to contract auditors was eliminated, and the designated independent senior acquisition official (who served as advisor to the contracting officer on audit report recommendations with which the contracting officer did not agree) was replaced by the normal management review process. Additionally, the dollar thresholds at which significant post-award audits must be reported to top acquisition managers and to the IG for reporting to the Congress were raised to $100,000.

In June 1988, the DEPSECDEF reassigned the responsibility for determining final indirect cost rates and interim billing rates at larger contractor locations to contracting officers. This responsibility was previously held by contracting officers, but had been transferred to contract auditors in 1985. The assignment of this responsibility to contract auditors was frequently cited as contributing to the eroding authority of contracting officers.

These actions have contributed to the restoration of the authority of individual contracting officers.

Contractor Risk Assessment Guide Program

In November 1988, the SECDEF formally issued the Contractor Risk Assessment Guide (CRAG) for use by the DOD and industry. The CRAG program is a joint DOD-industry initiative aimed at eliminating duplicative or unnecessary oversight by placing more reliance on effective systems of contractor internal control. It is designed to encourage contractor self-governance, motivate contractors to develop more effective internal control systems, and improve the effectiveness and efficiency of DOD oversight efforts. The CRAG assists contractors in establishing internal controls that provide DOD the assurance that direct DOD oversight can be reduced without reducing overall oversight effectiveness.

The CRAG lists internal control systems objectives for contractor indirect cost submissions, labor charging systems, material management and accounting systems, estimating systems, and purchasing systems. If a contractor can demonstrate that the internal control systems used by the company meet the stated CRAG objectives in one or more of these areas, DOD audit and oversight in the area(s) will be reduced. Reliance on the integrity of the contractor's internal control system, rather than on detailed transaction audits, results in more efficient use of the DOD's audit and oversight resources and contributes to a less adversarial relationship between the DOD and industry. Ultimately, the DOD must retain the responsibility for deciding how much audit and oversight coverage is sufficient to protect the public interest. Participation by contractors in the CRAG program is on a voluntary basis.

Increase in Thresholds for Preaward Reviews and Audits

Thresholds for preaward reviews and audits of the DOD's contracts were raised from $100,000 for firm-fixed-price contracts and $250,000 for fixed-price-incentive contracts to $500,000, and from $500,000 for cost-reimbursement contracts to $1,000,000 on June 4, 1987. Defense contractors had frequently complained that there is duplication in the preaward review area; increasing the dollar thresholds reduces the number of reviews and audits that are required to be performed and therefore reduces any perceived duplication. At the same time, because of the increased emphasis the DOD was placing on the need for reliable contractor cost-estimating systems and the periodic review of these systems, proper controls appear to be in place now to protect the government's interests.

Thus, by emphasizing the importance of good contractor systems and by structuring the audit and oversight function to concentrate on systems reviews rather than individual proposal reviews, audit and oversight effort can be reduced, thereby reducing the potential for duplication. The potential for defective pricing will also be reduced for contractors with good estimating systems.

Limited Scope Audits

On April 29, 1988, DCAA directed its auditors to recognize contracting officer requests for audits of portions of a contractor's proposal. In the past, contract auditors would sometimes review the entire proposal submitted by a contractor even though the contracting officer might already have information available that would obviate the need for auditor review of some portions of a proposal.

This change in procedure permitted the contracting officer to request an audit of only those elements of a contractor's proposal the contracting officer needs audited; thus, the contracting officer could rely on other readily available information and request audit coverage tailored to the specific need.

USD(A) Memorandum on Contract Audits

On April 28, 1988, the USD(A) issued a policy memorandum directing that scarce audit resources be used on contracts where the DOD had the greatest risks to ensure the best utilization of these resources. Guidelines were set forth for requesting various types of preaward audit reports so the request would be tailored to ask for the minimum essential information needed to ensure a fair and reasonable price was achieved.

Requirement to Obtain Contractor Cost or Pricing Data

The Department issued guidance to the Services and defense agencies on May 1, 1987, instructing these organizations to refrain from obtaining cost or pricing data when adequate price competition existed on a particular proposal. When cost or pricing data were not obtained because

adequate price competition had been achieved, there was no requirement to obtain complete preaward reviews and audits. By emphasizing to contracting officers the need to obtain only data that are necessary for the particular procurement action, unnecessary and potentially duplicative audit and review activity is minimized.

Contractor Compensation Reviews

As of October 1, 1987, the responsibility for performing contractor compensation reviews was transferred to one agency within the DOD to preclude duplicate or overlapping reviews of contractor compensation systems and costs. By assigning this responsibility to one agency, there was no potential for duplication in the audit and oversight of contractor compensation systems.

Coordination Among DOD Internal Auditor Organizations, DCAA, and GAO

The DOD revised its audit policy so internal audit and review organizations were required to utilize the services of DCAA auditors whenever a review of contractor records is necessary. Internal auditors now had to review contractor records on an exception basis only. These new procedures prevented situations where, for example, two separate audit organizations performed defective pricing reviews of the same contract, including a separate review of contractor records.

The IG issued a policy directive on June 10, 1988, requiring their auditors to place more reliance on DCAA for the review of contractor records. The GAO was asked to execute a memorandum of understanding stating they would rely on DCAA to review contractor records whenever possible.

Spare Parts Pricing

The DOD paid increased attention to the area of spare parts pricing since 1983 when allegations of overpricing surfaced. Significant changes were made to the management of the DOD spare parts mission as a result. A rigorous approach was adopted for analyzing contractors' spare parts proposals, so an in-depth evaluation is now required to ensure line item price integrity. The DCAA recently agreed to provide contracting officers additional information regarding line-item pricing where it would serve to eliminate the need for additional analysis of contractor records by contract administration or procurement personnel.

A policy letter was issued on October 3, 1988, to procurement and contract administration activities informing them of the need to request specifically line-item reporting by the auditor for spare parts pricing proposals. Additionally, the DOD will now periodically review the necessity for such in-depth analysis of spare parts proposals to determine if improvements in the pricing of spare parts are sufficient to justify reduced analysis.

Should Cost Reviews

Should cost reviews are specialized forms of cost analysis for individual contract proposals or for overhead forward pricing. A should cost review is performed by an integrated team that evaluates a contractor's proposal on a fully-coordinated basis to identify uneconomical and inefficient practices in the contractor's management and operations. The resulting analyses provide the basis for a government negotiating position and ultimately result in achieving more efficient and economical contractor operations.

The decision to conduct a should cost review must be made as early as possible in order to preclude duplication of review and audit effort. Preplanning with the resident contract administration and audit offices is necessary to reduce potential duplication. Information already furnished to the government should be used to the maximum extent possible, and all additional data requested from the contractor must be closely monitored and shared by team members during the review to preclude duplicate requests for contractor data.

A policy letter was issued to the Services and defense agencies on October 31, 1988, emphasizing the importance of these procedures in order to minimize duplication and unnecessary effort.

Acquisition Review and Oversight

Actions to Reduce Duplication Review and Excessive Oversight

A number of actions designed to reduce duplication of review and excessive oversight are being developed.

Coordination of Audit and Review Policies

Audit and oversight review policies and procedures frequently are issued by organizations responsible for procurement, contract management, contract administration and contract audit. There is no requirement for centralized review of these policies and procedures to ensure they are tailored to eliminate the potential for duplication or overlap, and responsibilities and jurisdictions are clearly assigned to the most appropriate organizations.

The DOD had intended to require a review of all new policies and procedures that impose additional audit or oversight review requirements on contractors. This review would have been performed by the offices of the USD(A), the IG, and the DOD Comptroller to ensure that: a need existed for the type of review being proposed; potential duplication and overlap with other reviews was minimized; the most appropriate organization was assigned the responsibility for performing the review; mandatory professional standards (such as the auditing standards issued by the GAO) were considered; and the cost to the government and the contractor for performing the review was considered in light of the potential benefits to be achieved.

However, the "Office of Federal Procurement Policy Act Amendments of 1988" recently signed into law included a requirement that a DOD official approve or disapprove all procurement regulations prior to their issuance in final form. Therefore, it was necessary for the DOD to evaluate this legislation to determine how it can be implemented before issuing any other requirement for review of regulations.

Contractor Purchasing System Reviews

According to the new law, contractor purchasing system reviews must be conducted by the cognizant contract administration office at least every three years for contractors whose sales to the government are expected to exceed $10 million during the next 12 months. In the period between these reviews, administrative contracting officers (ACOs) tested periodically the purchasing system to ensure the contractor is effectively managing its purchasing program. The ACO must make an annual determination to continue approval or to withdraw approval of the contractor's system. The auditor also must perform comprehensive reviews of the contractor's subcontract management program, which is part of the purchasing system. Outside organizations or teams may also review the purchasing system.

Since acquisition regulations assign to the ACO the authority to review contractor purchasing systems, other organizations should not conduct separate reviews. Other organizations may participate in the review conducted by the ACO, or may recommend an additional review be performed if they believe a problem exists. If the ACO determines an additional review is necessary, it should be performed as part of an ACO-initiated special review.

Technical Reviews

In some instances, auditors obtain technical analyses from DCAA engineering/technical specialists. The FAR and the DFARS specifically assign the responsibility for performing engineering/technical analyses to the contract administration office, while DOD Directive 5105.36, "Defense Contract Audit Agency," specifically assigns the responsibility for performing contract audits and providing accounting and financial advisory services to DCAA. Thus, missions and responsibilities are clearly defined through regulations already in existence.

To ensure that duplication or overlap of effort is avoided, the IG has agreed to issue policy guidance to require contract auditors to rely on the ACO for any needed technical analyses. This guidance was issued in December 1988. It provides for notification to the Deputy Assistant Secretary of Defense for Procurement if contract administration offices continually fail to provide such services.

Chapter 77

Transition from Development to Production

In response to the findings of 1982 Defense Science Board meeting, the Task Force on "Transition from Development to Production," chaired by Willis J. Willoughby, Jr., developed a manual issued under the authority of DOD Directive 4245.7 on January 19, 1984. According to Dr. James P. Wade, Jr., ASD (Acquisition and Logistics), the Manual provides assistance in structuring technically sound programs, assessing their risk, and identifying areas needing corrective action. The Manual applies to the Office of the Secretary of Defense, the military departments, the Organization of the Joint Chiefs of Staff, and the defense agencies.

In the Preface to the Manual, Mr. Willoughby made the following statement, "...there has been, is now, and may always be one principle in which we must strive for further improvement. *That principle is disciplined engineering.* It is of such fundamental importance that it drives all aspects of development and production in any successful material acquisition. When recognized, disciplined engineering dictates all facets of management. In short, everything in the acquisition process in the Department of Defense should be subservient to it; yet most of our management systems are designed to circumvent it or excuse its omission. The irony is that in today's explosion of computer utilization and the attendant time it takes to incorporate changes, we should be seeing disciplined engineering in all of its grandeur and splendor: disciplined engineering in design, *disciplined engineering in test, and disciplined engineering in production.*

Additionally, we must strive for improvement in the understanding and the timing of the disciplines of design, test, and production. Successfully accomplishing the engineering tasks on schedule is the important "key" to reducing the risk of a program. This has a direct and profound impact on the quality of the decisions we make on individual programs, and, in my judgment, has a more immediate and potentially much greater return on investment in time and effort (and thereby on both cost and performance as well). Most importantly, we can achieve this return on investment with the application of current policy cited in the parent document to this Manual (DoD Directive 4245.7) and using established procedures within the presently defined acquisition process."

The key word is "discipline." Mr. Willoughby, when releasing the document for use throughout the DOD, indicated the document was designed to facilitate the discipline that would help engineers and manufacturing personnel make wiser decisions on ongoing programs through the use of templates. The templates would be used to compare ongoing programs to see whether the decisions being made and the actions on which they are based fall within the boundaries of an efficient, effective, low risk program. The templates were an attempt to introduce discipline into the system, to identify and provide visibility to high risk factors, and provide the tools by which risk could be minimized progressively.

The Manual (DOD 4245.7-M), covers funding, design, test, production, transition plan, facilities, logistics and management.

In September 1985, a major new DOD initiative was to implement the philosophy and managerial approach involved with TQM and consisted of a new template. The new template aggregated TQM provisions by highlighting key design, test and production template activity and identifying certain advances in TQM methods and techniques that come to prominence.

Total quality management is the disciplined process of continuous improvement in performance at every level and in all areas of responsibility within the DOD. Improved performance is directed toward goals assigned to cost, schedule, mission need and operational suitability. Increasing "user" satisfaction is the paramount objective. Whereas the Manual concentrates on the industrial process concerned with the acquisition of materiel, TQM principles are applicable equally to supporting functions and military operations.

Total quality management was approved for application DOD-wide by the Secretary of Defense on March 30, 1988, assigning it "top priority." On August 30, 1988, the USD(A) issued direction to implement TQM in the acquisition process and called for a climate in government and industry that would foster TQM implementation. Total quality management affects everything the DOD produces, procures or performs. It is appropriate to all templates and nonacquisition activities. Total quality management requires professional discipline and commitment from the DOD and industry. (See Figure 18.)

Chapter 78

Emphasis on Quality

In June 1985, Deputy Secretary of Defense Taft made a major statement on the important subject of quality. "The quality of American industrial products and our nations defense systems are closely related," he said, "and the Department of Defense is committed to reviewing both." He added that we have had to overcome many of the same problems in quality that have plagued the American industry in general. The standard of too many American companies has been to produce the "minimum acceptable" quality to reap the maximum short-run profit. Such a standard is not acceptable for our defense and it will not keep America competitive in the internation marketplace.

The DOD was rising to meet the challenge of renewing its industrial law. It required vision, participation, performance and integrity, as well as short-term sacrifices to achieve the innovations that flow from the minds of free people. The role of the DOD was evident by the longstanding emphasis on quality and reliability methods and procedures. The need for quality weapons and material was self-evident; the defense of freedom ultimately depends on equipment that works. The United States could not send her young men into combat with inferior equipment, or equipment that would not operate as designed in the heat of battle. Furthermore, increased quality, yielding less scrap and rework, was a key to greater productivity, and greater defense acquisition efficiency that can save millions of taxpayers' dollars. As an example of what can be done, in one division of one of our major defense contractors, quality initiatives cut the costs of scrap, rework and repair from 7.9 percent of manufacturing direct-labor hours in 1980 to 3.3 percent in 1984. This improvement equated to a savings of $37 million, and was indicative of savings that could be achieved throughout American industry.

Through numerous acquisition reforms, we were getting more defense for each dollar. Cost growth of major weapon systems declined sharply from 14 percent in FY 1980 to less than one percent in fiscal 1983. Multiyear programs and more economical production rates approved between 1980 and 1984 saved the DOD more than $7 billion. During FY 1984 the DOD competed, either directly or through follow-on contracts, a record 72 percent of all procurement dollars — saving billions of dollars. The $100 million invested in spare parts reforms in 1983 to aggressively breakout items from the prime contractor for competition or for direct purchase from the actual manufacturer returned nearly $1.2 billion.

To meet future defense requirements in today's deficit-driven budget environment, the DOD would have to become even *more* efficient in how it conducts defense business.

In rebuilding a quality defense to provide high-quality security for our nation, the Defense Department would have to do its utmost to help restore excellence and competitiveness to American industry. It did so through determination, and the sheer scope of its operations would have a major effect on American industry.

The DOD is by far the largest purchaser of goods and services in the federal government. That gives DOD significant responsibility and leverage in promoting quality and productivity in the commercial base on which the defense so heavily relies.

To halt what appeared to be a bureaucratic turf fight between Under Secretary of Defense for Research and Engineering Donald Hicks and Assistant Secretary of Defense for Acquisition and Logistics James Wade, Deputy Secretary of Defense Taft divested Wade of his dual roles as Defense Acquisition Executive and Procurement Executive on November 19, 1985 and assigned himself to those roles.

In the memo announcing this reassignment, Taft stated: "In accordance with Public Law 98-191, the 'Office of Federal Procurement Policy Act,' December 1, 1983, and OMB Circular A-109, 'Major Systems Acquisitions,' April 5, 1976, I am assuming the role of the Defense Acquisition Executive (DAE) effective immediately. Consistent with this decision, I will also assume the role of the Department's Procurement Executive. This is necessary action to fulfill the intent of the legislation to designate a single individual responsible for all phases of the acquisition of procurement process."

At the same time, Taft issued revisions to DOD Directive 5000.1 and the accompanying DOD Instruction 5000.2, which pertain to major systems acquisitions; and DOD Directives 5128.1 and 5129.1, which outline the respective duties of the ASD(A&L) and the USDRE. The revisions reflected the changes made in the duties assigned to the DEPSEC, the USDRE, and the ASD(A&L) in light of Taft's memo.

Under the revised Directive 5000.1, the DEPSEC is designated the DAE and the Procurement Executive (PE). He also was designated the "principal advisor to the Secretary of Defense for the acquisition of defense systems and equipment."

In addition, under the revision to Directive 5000.1, the DEPSEC assumed the chairmanship of the DSARC, through which he would ensure the management process, policies and procedures for major systems acquisition were integrated and unified.

The revised directive further specified that the USDRE and the ASD(A&L) would serve as permanent DSARC members, with the USDRE acting as chair for Milestone 0, I and II DSARC reviews (mission need, demonstration/validation, and FSD) and the ASD(A&L) acting as chair for Milestone III DSARC reviews (production).

Taft's reapportioning of duties came in the wake of a recent major reorganization of the acquisition function within the Office of the Secretary of Defense. Prior to the shuffle in February 1985, the USDRE chaired the DSARC and exerted strong control over the procurement process. However, the reorganization separated research and development from acquisition by creating a new Assistant Secretary for Acquisition and Logistics (ASD(A&L)) who reported directly to the Deputy Secretary, not to the USDRE. The DSARC duties were divided between the two offices.

Two weeks prior to the actions taken by DEPSECDEF Taft, ASD(A&L) Wade expressed his views on several aspects of defense procurement in a 42-page "white paper" titled "DoD Acquisition Improvement – The Challenge Ahead." The paper was made available to the press through the Project on Military Procurement, a nonprofit Pentagon watchdog group headed by Dina Rasor.

A brief summary of Wade's views contained in the paper follows:

–*Defense System Quality*. Quality must be a top priority. The DOD must discard the traditional concept of a minimally acceptable level of quality and adopt a policy of "quality first."

– –*Acquisition and Logistics Workforce*. Current personnel laws and rules (1985 laws and rules) restrict hiring, training, and promotion of acquisition personnel. Wade said "We do not need more people - but we need superior, better qualified people." In order to attract and retain talented professionals, acquisition must become "a true career path with ample opportunity for promotion in related areas," and changes must be made in pay structures, rotational programs, training, and DOD-wide personnel procedures. To achieve this, Wade indicated, "it is necessary to civilianize many of the now restricted program management positions." Military personnel tend to rotate out after a number of years and do not provide the necessary continuity in acquisition programs.

Wade proposed three solutions that involved varying levels of centralization of acquisition personnel management.

The first option would be to create a professional service known as the Defense Acquisition Corps. This would include all contract and procurement-related personnel, including engineers and scientists.

The next option would be to establish an elite "Acquisition Corps" composed of highly-qualified professionals, who would be managed by an OSD-chaired council directed by a civilian. Military officers "would occupy key positions for which they qualify."

The third option would be to establish a Defense Acquisition Agency within the OSD. All members of the Acquisition Corps would work for the agency. A liaison office would be set up in each Service and agency to determine the needs of each.

–*DOD Acquisition Organization Structure*. Wade believed the current structure was "ponderous, inflexible, and so layered as to make it virtually impossible to maintain accountability." He said the structure needed to be streamlined and revamped to provide clearly defined lines of authority, responsibility, and accountability.

–*Defining Requirements*. According to Wade, the current defense system design and development process was "not oriented to emphasize cost trade-offs and optimizing

contract requirements....There is no close, continuous association of users, developers, the Research and Development (R&D) community, and manufacturers," he said. It was his belief that an effort must be made to streamline front-end requirements and to keep initial designs "flexible" to allow for more rapid introduction of new technology into the designs as they arrived.

—*Manufacturing and Productivity.* Although some effort was being made to provide incentives for contractors to improve their technology and manufacturing methods, Wade believed more needed to be done. He suggested that the Manufacturing Technology Program (Man Tech) be restructured to ensure greater DOD component support, and the Industrial Modernization Incentives Program (IMIP) methodologies be simplified to facilitate wider application.

—*Defense Industry/Government Relationship.* Wade recognized that an "unhealthy tension" existed between DOD and industry due to horror stories relating to overpricing and fraud. "Poor morale leads to poor performance," he said. He believed it was necessary to strike a balance between an adversarial relationship with industry on the one hand and an incestuous relationship on the other.

As yet, no action has been taken on any of Wade's suggestions.

Chapter 79

Total Quality Management

On February 10, 1987, Secretary of Defense Casper W. Weinberger issued DOD Directive 5134.1, which assigned the responsibilities, functions, and authorities of the Under Secretary of Defense for Acquisition (USD(A)) to Mr. Richard P. Godwin. This was the final step in fulfilling one of the key findings of the President's Commission on Defense Management, which had recommended that all DOD acquisition management functions be consolidated under a top-level DOD official reporting to the Secretary of Defense.

The Directive provided that the USD(A) serve as the DAE, the DOD Procurement Executive, and the principal assistant to the SECDEF for acquisition management. As such, he would supervise all matters within the DOD relating to the acquisition system.

Because quality in defense systems is central to the DOD mission, Secretary of Defense Frank C. Carlucci (who succeeded Mr. Weinberger) asked the USD(A) to lead the TQM thrust by "implementing it as an integral element of the entire acquisition process." Secretary of Defense Carlucci believed that by so doing, the USD(A) would be seeking a fundamental change in how the acquisition community viewed product quality. Further, the USD(A) would have the responsibility for developing the policies and seeking the appropriate FAR and other regulatory changes to ensure that TQM was enforced in requirements formulation, design, development, production planning, solicitation and source selection, manufacturing, fielding and support. He would ensure that all program managers were trained to apply TQM measures in acquisition planning and throughout all aspects of program execution.

In a memorandum to the Assistant Secretaries of the Army, Navy and Air Force, as well as the Director of the DLA, on October 5, 1987, "DOD Total Quality Management Strategy," Robert B. Costello, Assistant Secretary of Defense (Production and Logistics) (ASD(P&L)) stated, "Quality has a significant bearing on the cost and field performance of defense systems and equipment. It is an important element of all aspects of the defense acquisition process. We will take an active leadership role in charting a course for emphasizing quality, which is of prime DoD interest as well as of national importance. We applaud current initiatives to develop innovative approaches for achieving quality in all that we make and do."

Mr. Costello said we will integrate all of our efforts related to quality into a coordinated DOD total quality management strategy. He indicated this effort would have as its prime goal the delivery of high-quality hardware and software to our soldiers, sailors, airmen and marines. He said we can only achieve this through a total cultural change in DOD with respect to attention to, and continuous improvement of, quality. He said greater emphasis was needed to integrate effectively key management initiatives and concepts that impact quality. The total quality management strategy, he believed, would provide the necessary training and incentives for

industry and government personnel to improve the quality and reduce the cost of DOD defense systems and equipment.

Furthermore, Mr. Costello said that the total quality management strategy would include efforts to improve the quality of work and products produced by workers whose products were in paper of data form. He believed it was imperative continuous quality improvement efforts be applied to this important area.

In a presentation to the Senate Armed Services Committee on November 19, 1987, when he was being considered for the position of USD(A), he made a series of comments regarding total quality management worthy of quoting here. He said, "Total quality management...has a goal of improving the quality of department of defense products and services while achieving substantial reductions in the cost of ownership throughout the life cycle of our weapon systems. To achieve this goal, we must change the traditional inspection oriented focus on quality to emphasize quality earlier in the weapon systems acquisition process; to emphasize competition based on quality as well as performance, cost, and schedule; to exploit the ingenuity of all our personnel to achieve quality improvements in all of our efforts; to encourage the implementation of concepts such as statistical process controls and continuous process improvement; and to emphasize the use of sound weapon systems engineering design and manufacturing practices.

The application of total quality management principles is the only way we can achieve world class value from which we all can benefit. Our worldwide competitors are effectively applying quality technology and concepts that originated in the United States. Unfortunately, we, in department of defense and industry, have not readily recognized that quality technology is the key. Dr. W. Edwards Deming, an American and the world's leading expert on quality and productivity enhancement, makes his home and office right here in Washington, D.C., but has had all his adherents in Japan. We must change this. The quality technology we must apply includes: continuous process improvement, automated process controls, self-correcting manufacturing processes, built-in diagnostics, automated inspection, and statistical process controls...The broad goal for this strategy is to change our cultural mind-set in regard to quality. We need to strongly signal that the department is taking a leadership position and is committed; concurrently with our leadership role for bolstering industrial competitiveness.

Under the total quality management strategy, all of us are integrating the most important management initiatives related to quality. The policy areas we are integrating in this strategy include: acquisition streamlining, competition for quality, statistical process control and continuous process improvement, efforts associated with improving the transition from development to production, value engineering, warranties, and gain-sharing.

We are using the total quality management strategy as the means to reducing the cost of ownership for department of defense weapon systems and components; and to assure that our performance, producibility, reliability, and serviceability goals are realistic.

We have developed the concept of total quality management to be consistent with the DOD posture on quality, which states: an efficient defense industry with its underlying industrial base is the key to our ability to maintain qualitative superiority and readiness; quality is absolutely vital to our defense, and requires a commitment to continuous improvement; improvements in quality provide an excellent return on investment and, therefore, must be pursued to achieve productivity gains; technology, being one of our greatest assets, must be widely used to continuously improve the quality of defense systems, equipment, and services; quality must be a key element of competition; acquisition strategies must include quality objectives, and lessen ownership costs; managers at all levels must be held accountable for the quality of their efforts; competent, dedicated employees can make the greatest contributions to quality and productivity, and must be recognized and rewarded accordingly; quality concepts must be ingrained throughout every organization with the proper training at each level and; sustained department of defense-wide activity, vigilance, and concern with respect to high quality and productivity goals must be a permanent part of our culture."

In March 1988, Secretary of Defense Frank C. Carlucci stated that it was critical for the DOD, its contractors, and their members to focus on quality as the vehicle for achieving higher levels of performance. In a memorandum to top DOD management, March 30, 1988, "DOD Posture on Quality," he said:

> The DoD budget leaves no room for solving problems that flow from poor quality. Quality is synonymous with excellence. It cannot be achieved by slogans and exhortation alone, but by planning for the right things and setting in place a continuous quality improvement process.
>
> Total Quality Management (TQM) is a concept that demands top management leadership and continuous involvement in the process activities. The successful TQM operation is characterized by an organization of quality trained and motivated employees, working in an environment where managers encourage creativity, initiative, and trust, and where each individual's contributions are actively sought to upgrade quality. Secretary Weinberger's memorandum of February 2, 1987, asked you to create teams of line managers at all levels to remove organizational and procedural impediments to productivity and quality. These productivity and quality teams should play an important role in the DoD TQM process.
>
> I am giving top priority to the DoD Total Quality Management (TQM) effort as the vehicle for attaining continuous quality improvement in our operations, and as a major strategy to meet the President's productivity objectives under Executive Order 12552...We now need to expand the TQM effort throughout DoD. The ultimate goal is the satisfied, quality-equipped, quality-supported soldier, sailor, airman, and Marine.

The SECDEF recognized that quality in defense systems is central to the DOD mission. Accordingly, he asked the USD(A) to lead the TQM thrust by implementing it as an integral element of the entire acquisition process. In doing so, the SECDEF sought a fundamental change in how the acquisition community viewed product quality. See the "DoD Posture on Quality" issued by Secretary of Defense Carlucci.

It was Secretary of Defense Carlucci's belief that as the DOD moved forward with implementation of the TQM process DOD-wide it would be strengthened, not only internally, but would be better partner in its relationships with industry, the Congress, and the public.

In a report to the President of the Senate and the Speaker of the House in December 1988, Under Secretary of Defense for Acquisition Robert B. Costello stated he was pleased to report on DOD actions to simplify and streamline the acquisition procedures. He said that Section 809 of the National Defense Authorization Act of FY 1989 and Conference Report 100-989 require the USD(A) to report to the Congress on programs to simplify DOD acquisition procedures. Specifically, Dr. Costello said, "we are required to analyze our simplification programs, regulations, and existing laws, and to describe the results of the joint study undertaken by the Under Secretary, the DOD Inspector General, and the Comptroller to prevent duplicative audit and oversight reviews of DoD contractors."

The report included a discussion of the feasibility and desirability of structuring oversight based on risk assessment; granting authority to a senior DOD official to resolve complaints regarding duplicative oversight activities; establishing formal independent means to ensure quality, integrity and professionalism in performance of audit and oversight functions, and establishing policy to prohibit duplicative reviews of contractor activities. Dr. Costello indicated the DOD was committed to simplifying the acquisition process and reducing duplicative and excessive oversight activities.

Quality Quandary

In the late 1970s, the ideas of W. Edwards Deming, Joseph Juran and Philip Crosby took on a new urgency. American companies, accustomed to dominating world trade, found their hold was broken by the Japanese and other purveyors of lower operating costs. The American companies needed help and these men were talking. Even with the hype, executives got the message. Companies shed their extra management layers, paid more attention to their customers, and tried to design quality into their products. This emphasis helped to lower costs, reduce inventories and improve customer satisfaction.

Mark L. Goldstein, writing in the July 1989 issue of the *Government Executive*, indicated that:

> ...federal agencies traditionally have had no competition. Thus, they have obligingly conformed to economic theory: Without competition there is no incentive to cut costs or improve service. But along came Gramm-Rudman-

Hollings, the budget deficit and the push for privatization, and now the business of government is being shaken, just as the automobile and consumer electronics industries were 10 years ago. With fewer resources to accomplish increased program demands, government managers are being forced to think more like their private sector counterparts. Max Weber's model of the self-perpetuating bureaucracy hasn't been tossed away, but some agencies are talking in terms of stockholders and stakeholders....

Can the government wade through the hype and grab hold of the concepts that make some private organizations successful? The motives of the private and public sectors differ, but the problems are strikingly similar: unfocused missions, inattention to quality, employee indifference, ignorance of customer needs and a complex hierarchy that hinders effective communication at all layers of the organization.

To help the federal government tackle these difficulties, the President's Council on Management Improvement (PCMI) two years ago met with 25 private sector management experts to determine which of the corporate world's quality concepts could be transferred to Uncle Sam. The answer, of course, was just about all of them. With the help of the Office of Management and Budget (OMB), an agency, many critics said, that paid little attention to the "M" in its name, PCMI began raising awareness of quality and productivity issues. The Federal Quality Institute was created in 1988 to introduce government managers to ideas, many of them common sense, that could lead to better performance. A conference on Quality and Productivity Improvement was sponsored by the two organizations last year, (1988), and a second one held in June attracted more than 1,000 federal managers.

1989 TQM Survey

A 1989 survey, conducted by Louis Harris and Associates for Coopers and Lybrand, an accounting and consulting firm, polled 602 top federal executives and found that more than three-quarters of them are familiar with quality management principles. More than 90 percent think the quality and reliability of their agencies' products and services is either "excellent" or "pretty good." Two-thirds of the executives surveyed indicated their agencies have started training managers in quality management principles, and more than a third of the agencies had started full-scale implementation of TQM. At the same time, one in five executives said they have no plans to even take the first step in TQM by 1991, despite an April 1988 executive order issued by President Reagan requiring agencies to develop quality initiatives by that date.

The study showed most executives thought TQM would work best in defense agencies, where some notable advances had already been made. Three-quarters of the executives contacted for the survey were from civilian agencies, but when asked where they thought TQM would be most successful, almost 60 percent responded with the name of a military branch. No civilian

agency was listed by more than 17 percent of the executives as likely to be most successful. Philip Odeen, manager of Coopers and Lybrand's federal consulting services, said at a news conference that "TQM has been at least as effective in service industries" as in manufacturing operations like those overseen by the Pentagon. Some federal managers are skeptical. Of those surveyed, 30 percent thought TQM would not be very effective in keeping costs down.

The survey showed that executives see roadblocks in the way of effective quality management. Three out of four see at least one major obstacle to implementing a quality program. The obstacles range from a lack of dependable ways to measure quality to employee resistance.

Coopers and Lybrand is among firms that have contracted to help agencies implement total quality management programs. Odeen believes the survey results indicate support for TQM is wide, but not deep. Without a stronger commitment, said Odeen, government is "simply not going to get the kind of results" it wants.

In December 1989, Under Secretary of Defense for Acquisition John A. Betti indicated he planned to implement the Packard Commission's recommendations, the Goldwater-Nichole Act, and approach set forth in the Secretary's Defense Management Report to the President. He said the Congress and industry were in agreement that change was necessary and indicated a willingness in help in that process. Betti indicated that "change is a continuous process, and the real results of our efforts may not be evident in major programs until more than a decade from now." There were four problems that Betti believed would effect the changes needed: impatience, resistance, parochialism and superficiality. He believed the time was ripe for the changes and critically important to America's defense and future success.

Under Secretary of Defense Betti believed the defense management report provided a mandate for fundamental cultural change as well as a direction and framework for the change. He said, "It articulates a management philosophy that emphasizes the importance of teamwork, improved communication DoD-wide, manager's participation in the policy-making process, innovation, integrity and accountability."

In an article published in the November/December issue of *Defense '89*, Betti indicated "The best way to enhance DoD-industry relations is by improving the quality of defense products and services. At the heart of this is DoD's total quality management initiative. There are many views and definitions of total quality management floating around, but in my opinion, the essential elements can be boiled down to a few statements:

—Total quality management is not a new concept. In its most fundamental sense, it is an umbrella for all efforts focused on paying attention to the fundamentals of the business.

—People are the essential ingredient of any enterprise. They must have a common sense of purpose and common commitment, and be motivated to do their best.

—The conceptual tools of total quality management include an emphasis on quality, customer orientation and continuous improvement.

The continuous and comprehensive change required by total quality management demands a change in an organization's culture that can be achieved only if top management is firmly committed to the process. I am firmly committed to the principles embodied by total quality management, and the secretary and deputy secretary are as well."

At a recent total quality management conference in Colorado sponsored jointly by members of the Congress, DOD and industry, Secretary of Defense Dick Cheney said:

> The notion of TQM is very much consistent with the defense management report. The Department of Defense will focus on quality, not just on price." Deputy Secretary Atwood has said: "Total quality management is the key phrase...I want you to know that Dick Cheney supports that, I support it, I know John Betti supports it, and I hope everybody in this department gets behind it because we're going to force this issue all the way down until we in the Department of Defense...adopt it and bring to bear products which truly represent the finest in the world.

References

1. U.S. Department of Defense Directive 5134.1, February 10, 1987.

2. Memorandum from Robert B. Costello to Assistant Secretary of the Army (Research, Development and Acquisition), Assistant Secretary of the Navy (Shipbuilding and Logistics), Assistant Secretary of the Air Force (Acquisition), Director, Defense Logistics Agency; "Department of Defense (DoD) Total Quality Management Strategy," October 5, 1987.

3. Memorandum from Frank C. Carlucci, Secretary of Defense, to top DOD management; "Department of Defense Posture on Quality," March 30, 1988.

4. Presentation by Robert B. Costello before meeting of the Senate Armed Services Committee on November 19, 1987 when he was being considered for the position of Under Secretary of Defense for Acquisition.

5. Article by Mark L. Goldstein, "Quality Quandary: Lip Service vs. Practice," Editor's Notebook, *Government Executive*, July 1989, p. 62.

6. Article by John A. Betti, Under Secretary of Defense for Acquisition, Defense '89, November/December 19[illegible] pp. 8-12.

Chapter 80

International Security

In the mid 1980s, a strong U.S. defense was not only a national issue, but an international issue. It involved meeting worldwide commitments, which protect the security interests of the United States and those of its allies. Therefore, the Comptroller General determined the work of the Government Accounting Office (GAO) in the international security arena over the next few years would be to address issues such as the U.S. strategy for meeting its commitments overseas, management and impact of the U.S. security assistance, and control over international transfer of conventional weapons and nuclear technologies.

New directions in U.S. foreign policy were influencing the U.S. strategy for meeting its overseas commitments. While the North Atlantic Treaty Organization (NATO) remained the primary defense commitment, defense planning was reflecting an increasing need to deal with the Soviet threat on a global basis. The DOD FYDP was intended to move it toward the long-term goal of being able to meet the demands of a worldwide war. The SECDEF, in the fiscal 1984 annual report to the Congress, stated that considering Soviet capabilities to launch concurrent attacks in NATO, Southwest Asia, and the Pacific, U.S. forces must be capable of defending all theaters simultaneously. In the Congress, the debate converged on how to reduce the growing budget deficit while maintaining a credible defense.

The Comptroller General reported that "Over the last few years, the GAO has provided information in response to the increasing congressional concern with the level of burden sharing by NATO Allies and Japan, particularly compared with the large costs incurred by the United States. This work has included examining Allied contributions to the common defense; the sharing of costs for common programs, such as the NATO Infrastructure Program; and host nation support provided by other Allies to offset United States stationing costs. In two reports, the GAO addressed some of these burden-sharing issues in the Federal Republic of Germany, the United Kingdom, Japan, and the Republic of Korea and identified the problems likely to impede these countries' willingness and ability to assume a greater share of the common defense burden." The GAO also reported on NATO's Long-Term Defense Program and the U.S.-Korean agreement for deployment of Air Force A-10 aircraft.

The GAO's work on base rights agreements included an overview of U.S. foreign basing and facility access. This work assessed the overall costs to the United States, as well as the benefits.

The GAO continued to review burden-sharing issues, particularly with NATO and Japan, and to provide information to the Congress about the progress and problems of allied burden-sharing initiatives. The GAO also reviewed how the NATO Allies would respond to a U.S. request for assistance if forces previously planned for use by NATO were diverted to Southwest Asia. The GAO also continued its assessments of basing agreements and how they affected U.S. defense costs and serve political, economic and military objectives.

The United States provides security assistance to help friendly and allied countries defend themselves, to promote closer military relationships wi'h U.S. forces, and to enable the United States to obtain access to overseas facilities. The primary basis for security assistance are the Foreign Assistance Act of 1961 and the Arms Export Control Act. The basic programs are Foreign Military Sales, Military Assistance, and International Military Education and Training.

Foreign Military Sales is a program through which DOD sells defense articles, defense services and training to foreign governments. Foreign Military Sales agreements are in effect with the:

— Near East and South Asia

— Europe and Canada

— East Asia and the Pacific

— American Republics

— Africa

— International Organizations.

Military Assistance Program is a program through which defense articles and defense services are provided to foreign countries as grant aid. Military Assistance Programs are in effect with:

— American Republics

— East Africa and the Pacific

— Europe and Canada

— Africa

— Near East and South Asia.

International Military Education and Training Program is providing training and training support to foreign personnel as grant assistance in:

— American Republics

— East Africa and the Pacific

— Near East and South Africa

– Europe and Canada

– Africa.

Note: The areas shown on these lists are indicated in order of most-to-least services being made available.

In addition to the above, Economic Support Funds are provided for balance-of-payments support and economic development projects, but these funds are justified on political and security grounds.

From 1980 to 1985, the cost of U.S. security assistance programs more than doubled to almost $10 billion per year. In addition to the basic program, many other activities are related to security assistance, such as the Foreign Military Cash Sales program. This program, managed by the DOD, approximated another $15 billion in arms flow. Commercial arms sales of about $3 billion annually are also licensed by the U.S. government.

PART NINE

QUEST FOR EXCELLENCE IN THE NINETIES

Chapter 81

Looking Ahead to the Next Decade

In February 1989, President George H. W. Bush charged the Secretary of Defense Dick Cheney to develop a plan that would make substantial improvements in the defense department.

The report outlines a series of specific management initiatives for better teamwork among DOD's senior managers, longer-range defense planning, and sound decisions on the use of defense resources. The report also describes significant changes to streamlining and disciplining the defense procurement process and encouraging better accountability and performance by defense contractors. Furthermore, the report details actions for the Congress to take to achieve lasting improvements in DOD operations, including simplification of federal procurement law and a reexamination of congressional budget and oversight practices.

Actions detailed in the report include the following:

—The Secretary will chair an executive committee, consisting of the DOD's top civilian leaders and the chairman of the Joint Chiefs of Staff, to serve as the key policy-making body for the DOD.

—The DEPSEC will oversee the PPBS and will revitalize the planning process to integrate more effectively defense resource decisions with national security policy.

—The USD(A) will exercise full management accountability for major acquisition programs through streamlined Service acquisition organizations, consisting of Service acquisition executives, program executive officers, and individual program managers.

—With a simplified and more efficient acquisition structure, the DOD will eliminate layers and functions that add no value, with the goal of achieving a $7.5 billion reduction in the annual cost for these functions by FY 1993.

—The USD(A) will manage a more disciplined process for reviewing major defense programs as they proceed through stages of development.

—The DOD will improve its management of civilian and military personnel, including establishing a dedicated corps of military officers within each military department, who will be career acquisition specialists.

—The DOD will consolidate its contract administration activities under a single new defense agency.

– The SECDEF will create a senior-level ethics council to oversee a vigorous ethics program for the Department's acquisition personnel.

– The DOD will encourage contractor self-governance and better contractor performance.

In suggesting these improvements in the defense acquisition system and more effective overall management of the DOD, the report details steps to implement the recommendations of the Packard Commission. Actions contained in the report are designed to help ensure the strength and readiness of the armed forces are preserved; needed defense systems are acquired at less cost, in less time, and with greater assurance of promised performance; and the highest standards of integrity and performance are maintained, resulting in greater public confidence in our stewardship of defense resources.

The dimension and importance of the task cannot be overstated. The course of international affairs in the years ahead promises to test U.S. leadership in new and unforeseeable ways. Potential threats to the security of the United States and its Allies are likely to diminish in some areas while increasing in others. They may well take new and more subtle forms, and undoubtedly will necessitate U.S. military forces that are modern, ready and sustainable in a variety of contingencies. At the same time, as a result of competing national priorities, the real resources available for defense in the early 1990s are likely to decline. If we are to continue to protect our global interests, meet our responsibilities, and minimize risks to our security, we must preserve essential military capabilities through even more skillful use of the resources at our disposal. These circumstances compel the United States to give the utmost attention to prudent management of a defense program, and oblige the executive branch, the Congress and industry, as seldom before, to join in husbanding available defense dollars, cutting unnecessary costs, and achieving new levels of productivity and quality.

Although this report is wide-ranging, the SECDEF has the authority to make many of the changes. Some changes will require concerted action by the Administration. Others, including those with the greatest promise for long-term improvements, will need the support of the Congress and the defense industry. No change represents a quick fix. Only an unreserved and sustained commitment on the part of the Administration, the Congress and industry will bring about real change.

Management of DOD will seek to ensure a connection between defense policy and military capabilities. To address the most difficult issues, an executive committee will be established under the chairmanship of the SECDEF. The committee will meet regularly and serve as the key, senior deliberative body within DOD for all major defense issues. It will include the Deputy Secretary, USD(A), Secretaries of the Military Departments, Under Secretary of Defense (Policy) (USD(P)), and Chairman of the Joint Chiefs of Staff (CJCS).

Defense Planning and Resources Board

The DEPSEC will manage a revitalized PPBS as chairman of the new Defense Planning and Resources Board (DPRB), which will have a smaller permanent membership than its predecessor, the DRB. The USD(P) will serve as the primary advisor during the biennial planning phase of the PPBS.

Defense Acquisition Board

The Under Secretary of Defense will be responsible for policy, administration, oversight and supervision of acquisition matters. He will discipline the procurement process through rigorous review of major programs by the DAB. The Under Secretary of Defense (Administration) authority will extend to directing the Service Secretaries on the manner in which acquisition responsibilities are executed by their departments.

With policy guidance from the Under Secretary of Defense (Administration), the management responsibilities for major defense programs will flow from an experienced, full-time Service acquisition executive in each military department, through full-time program executive officers (PEOs), as key middle managers, to individual program managers (PMs). The PMs will have broad responsibility for, and commensurate authority over, their programs and will report exclusively to their respective PEOs.

Consistent with this structure, the Services' systems and materiel commands will be organized with a primary focus on three roles: providing necessary logistical support; managing the smaller programs; and providing a variety of support services to PEOs and PMs, duplicating none of their management functions. In revising their acquisition organizations, the Service Secretaries will eliminate management layers and functions that do not add value; consolidate functions where possible; and improve the efficiency of DOD's acquisition management, logistics, distribution and related maintenance activities. By these means, DOD will reduce, on a phased basis, the DOD annual cost of such related functions by at least 15 percent (approximately $7.5 billion) by not later than FY 1993.

Joint Requirements Oversight Council (JROC)

To improve DOD efforts to define military needs consistent with national security policy, the Secretary and the Chairman of the JCS will charter the JROC, chaired by the Vice Chairman, JCS, to assume broader responsibilities for articulating military requirements and validating performance goals. Each year, the council will review all deficiencies that may require new major systems and provide the DAB with a prioritized list of system requirements to serve as the basis for the Concept Direction (Milestone 0) studies.

Defense Acquisition Board

The DAB review process will undergo additional changes. At Concept Approval (Milestone 1), the DAB will review requirement/cost trade-offs, initial affordability assessments, and other minimum required accomplishments. It will ensure that Concept Approval is given to no more new programs than long-term funds available to DOD are likely to support. The Full Scale Engineering Development (Milestone II) and Production (Milestone III) reviews will ensure that other, progressively more exacting requirements are met. A redefined Milestone IV, replacing the current Milestones IV and V, will address the need for major upgrades or modifications to systems still in production.

"Best Value" Competitive Practices

The USD(A) will ensure that plans for major programs can support early building and testing of prototypes, use of systems engineering, and validation of manufacturing processes. In addition, the USD(A) will expedite actions to expand DOD's reliance on commercially-available products, and to utilize "best value" competitive practices. For these purposes, the Administration will urge the enactment of the Commercial Products Acquisition Act of 1989, which would authorize the use of certain simpler, commercial-style procedures; a Commercial Acquisition Pilot Program, which would establish a program to apply a full range of commercial-style practices; and clarification of the Competition in Contracting Acts, to provide for more vigorous competition based on cost as well as other considerations.

Congressional Actions

Because the Congress plays a central role in U.S. defense policy, much depends on how it exerts its authority, and how well or poorly it carries out its responsibilities. For substantial, long-term improvement in defense management, the Congress must perform a careful and thorough reexamination of the various ways in which it, its staff and its agencies affect the DOD. Profound management problems and waste flow from the redundant procedures for budgeting, authorizing and appropriating defense resources each year.

The report details specific legislation, which the Administration will urge the Congress to enact. It stresses the urgency of congressional attention to broader reforms. First, congressional leadership should establish select committees in both houses to commence work as soon as possible on recodification and streamlining the maze of federal procurement laws. Second, the Congress should reexamine the various ways it influences DOD operations; especially the way it implements the biennial defense budget process.

Government-Industry Relationship

The DOD, in conjunction with the Department of Justice, will devote its full energies and resources to enforcement of applicable laws.

A senior-level DOD Ethics Council has been established to develop and maintain well-understood, broadly-observed, and vigorously-enforced official standards of conduct. The Council oversee's a program tailored to acquisition personnel and designed to enhance awareness and understanding of ethical issues that arise day-to-day.

Within the context of vigorous law enforcement, contractor self-governance remains the most promising additional mechanism to foster compliance in industry with established high standards. The DOD strongly supports the defense industry initiative on business ethics and conduct and other self-governance initiatives. The program encourages business integrity and honesty through voluntary disclosure of possible procurement offenses that were continued, as was the Contractor Risk Assessment Guide program, which provides more efficient use of DOD audit capabilities through greater reliance on effective contractor systems of internal controls.

Chapter 82

Personal Values and Ethical Standards

At the close of the last chapter, the importance of ethics — set of moral principles and values — was alluded to too briefly. Our ethical conduct and values are the key ingredients of character and enable us to withstand the challenges we have to face daily. Unfortunately, these challenges tempt some people to compromise their principles. When this happens, they and/or their businesses suffer.

Some thoughts that might come to mind right away when the subject of ethics is raised are: "What ought I to do?" "How should I act?" "What is meant by 'good'?" "Who is a good person?" "Is there an integrating core or unifying principle that gives cohesiveness and wholeness to the total concept of ethics?"

Ethics in Government and Industry

Ethical issues in government and industry have received unprecedented attention in the past few years. Honesty increases efficiency and productivity in governmental and industrial operations. Big government, like big industry, is no more or less dishonest than small government and small industry. Fortunately, most employees perform in accordance with generally accepted principles of what is right.

Ivan Hill believes an open society cannot function efficiently, or even be manageable, unless about 80 to 85 percent of the people within that society are honest 80 to 85 percent of the time. When this is not the case, it is likely that such a society will move into authoritarianism; that is, a society that requires absolute obedience to authority — no individual freedom.

What has happened to our traditional values in the United States? Why, until recently, did we show some tendency to retreat from ethical standards? Professor Amitai Etioni believes we have become caught up in excessive individualism. There is a lack of caring and of joining with others for the common good.

The federal government promotes ethics for military and civilian employees. In the early 1980s, the U.S. Congress passed a bill unanimously making it a requirement to display publicly the *United States Code of Ethics for Government Service* in federal buildings. Today, there are at least 100,000 posted in more than 10,000 public buildings throughout the United States.

Nonetheless, the government continues to sustain losses due to fraud, waste, and absenteeism. If we assume the code has a positive effect, then such adherence is providing substantial savings annually in government operations.

Challenges Executives Face

Louis W. Norris believes the principal crises of executives are moral in nature. The executive's job rarely is impersonal. His principal problems are what he does about people. The executive may have begun as a master craftsman, production expert or teacher; but, as an executive, he puts plans into action for people to carry out. Executive actions affect people. The criteria guiding his actions — his morals — are, therefore, an important feature of service as an executive. Norris concludes that the executive is continuously on the radarscope of public judgment.

Among the key tests of an executive are the capacity to accomplish the following:

— Compromise, but not too often

— Make decisions without knowing all the facts

— Accept responsibility for the mistakes of subordinates, but not allow too many

— Live up to the image associates demand, without becoming a victim

— Succeed as a person of thought as well as a person of action.

The standard of success must derive ultimately from moral issues. Some standard of value is expressed in every thought and action. The executive must think and act always in terms of the better alternative.

First, an executive must live with and make compromises. Leadership rests on an amalgamation of opinion — a fusion of standards. A good executive encourages differences and originality of judgment, and is able to choose between present and long-term values. He is able to balance material and nonmaterial values. In the end, executive ideals may actualize into compromise. Unfortunately, compromise disregards universal principle and may lead to undermining the executive's influence. Further, deviation from principle may become habit-forming. Shortsightedness, mediocrity or unpredictability can set in when principle is disregarded. Thus, an executive must not fail to evaluate the strength in tension between the value of compromise and adherence to principles.

Second, an executive must recognize the importance of controlling the truth. An executive rarely has the privilege of telling the truth, the whole truth and nothing but the truth. To illustrate: Truth when told bluntly may hurt a subordinate who is incompetent or misguided. If improvement appears possible for this subordinate, tactful treatment by the executive may involve careful selection of truths that can be told. However, if the executive decides to withhold truth on one occasion, will he do so on others? Can he be trusted to withhold the right truths? No executive tells all he knows as soon as he knows it.

Truth comprises propositions, values and relations. Only one part of the system can be handled at a time. The question is: How much importance is attached to that part of the whole truth that is made known, and how much is assigned to the remainder that is not made known?

The integrity of an executive is essential. He is trusted with the direction of the organization as long as he is able to relate to its business. He must be able to recognize the whole truth about the organization's operation and handle partial truths called for on each occasion by reference to its part of the whole. A man of integrity is a fully integrated man. He can become so and remain so only by constant regard for the facts he knows – those he discloses and those he does not disclose.

Third, an executive must make a decision sometimes when all of the facts needed are not known, or cannot be obtained. The late Justice of the Supreme Court, Oliver Wendell Holmes, Jr., said, "Genius is the capacity to reach the proper conclusion before all the facts are in." It follows, then, that an executive often is called upon to be a genius. He dare not be wrong, though he may have to trust his judgment; if wrong, the result may be disastrous.

There is an unavoidable loneliness attached to the executive's position. Sometimes an executive vacillates between overconfidence and underconfidence in his own judgment; for example, persistent success can lead to overconfidence, and too many failures can lead to low morale.

Fourth, an executive should like his job because he must be able to handle the issues, however severe. All executive problems have been faced before. A diet of discerning analysis of value like those found in the *Sermon on the Mount*, Aristotle's *Ethics*, and Alfred North Whitehead's *Science and Modern World* provide a perspective and a pathway to solutions.

Fifth, some hazards occur if executives take responsibility for mistakes of a subordinate. Originality and initiative are essential if a subordinate hopes to be successful; responsibility matures the judgment of a subordinate. A moral issue arises when a subordinate's mistakes and failures reach the level when they become expensive or harmful to organizational prestige and colleagues' welfare.

If an executive is to attain success on the job – the kind of which he too can be proud – he must possess a concern for people. The question to answer is: "How far can I go in assuming responsibility for serious errors of my subordinates?" Limits must be set. A democratic administration depends for success on a common aim individually shared. A democratic executive influences subordinates; therefore, he must set standards of excellence with which subordinates can compare themselves. Subordinates' abilities or inabilities to attain high standards should become so apparent they will either improve or resign.

Sixth, an executive should lead, not boss. When using rigid discipline, he can meet with resistance, suspicion, hatred and other negative reactions. The successful executive is a morale builder – engendering a willingness in subordinates to work, to improve, and to cooperate.

Influences on Ethical Decisions

Many years ago, a poll determined what influenced an executive regarding ethical decisions. Results, most influential to least influential, were: executive's personal code of behavior, behavior of executive's superiors, formal policy of organization, ethical climate of organization, and behavior of the executive's peers in the organization. On the other hand, another poll determining what influences an executive to make unethical decisions, resulted in the following: behavior of executive's superiors in the organization, ethical climate of organization, behavior of executive's equals in organization, lack of an organizational policy, and personal financial needs.

From these rankings, we learn an executive acts ethically because of a personal set of values and the ability to resist pressure and temptation, giving some credit to superiors and policies of the organization. An executive often acts unethically because of his superior's behavior and the organizational environment.

Subordinates are influenced by an executive's behavior, and tend to accept the superior's values. This probably stems from a respect for the position and talents of the superior. Every executive should recognize this tendency as part of influence for good or evil; the more subordinates, the more influence. Subordinates expect responsible action to be taken by those invested with power.

Ethics in Management

Studies of human behavior reveal our value systems determine our attitudes, which determine our actions. Consider this. Our attitude toward a crumpled piece of paper on the sidewalk may be one of indifference or disgust; if a second glance reveals the piece of paper to be a $100 bill, our value system immediately changes our attitude. While we wouldn't stoop to pick up trash before, we no longer have a degrading thought as we reach for the money before someone else.

We need a universal value system — standards of conduct accepted and practiced worldwide. The possibility of this becoming a reality, of course, is a dream. In America, we assume other Americans will abide by common ethical principles.

Those who work for the U.S. government know their standards of conduct, integrity and concern for the public trust are expected to be above reproach. High standards of conduct and integrity, of course, also are desirable traits in government business, industry and other endeavors. Ignoring standards of conduct and lacking integrity are not excuses for not practicing them. One obligation to an employer is to recognize events vulnerable to fraud, waste and mismanagement, and to avoid entrapment. People possessing high standards of conduct act fairly and honestly.

We cannot afford to be naive, assuming everyone operates to the same value system. Our standards of conduct have changed throughout the centuries, but not always for the better.

Historians generally agree our value system started to decline in the 17th century. However, some see a ray of hope, a reverse in the trend, and claim our standards of conduct improved during the past 50 years.

Because of the uncertainty we face in dealing with ethical standards, we may find the only path is one of trial and error. This is difficult on U.S. defense systems programs, and more difficult on international programs. In the latter, a trial-and-error methodology could be disastrous.

The lack of an ethical science causes suffering within our society except, possibly, for amoral people. As world population increases, we may be forced to standardize ethical practices; but, this will not happen soon.

Ethics in Program Management

A program manager functions more effectively with personal values and ethical standards for daily guidance and to provide a greater sense of purpose than received form routine activities. Hurried, harried and harassed, the program manager has little time for reflection and contemplation. Daily program activities are the center of thoughts and actions and, too often, family and church are on the periphery. Although looking for inspiration, the program manager is occupied with the job at hand and has no time to reflect or be inspired. However, to attain program success, the kind of which to be proud, the program manager must show concern for people; then, he can assume situations requiring the application of high ethical standards, and be able to cope with moral judgments in a better way.

A program manager, often challenged to exert high ethical standards of leadership, may assert rights for personal privacy, but must know how to perform in a "fish-bowl." The moral and ethical tone of an organization is set at the top – in the case of program management, by the program manager. To be effective, the program manager must understand four principles of operation stated in the axioms below.

– *Success is preceded by discipline.* No one has found an easy route to successful program management. It takes hard work and diligence to keep a program on course, especially when the manager faces a seemingly overwhelming task. Although we assume most people are honest and trustworthy, we must be alert to those who are not.

– *When we compromise to gain, we eventually lose.* When we compromise our standards to achieve a goal, we will pay the consequences eventually.

– *We tend to judge ourselves by our intentions and others by their actions.* If we have a dual set of standards, we are heading for trouble. Fairness demands we judge everyone by the same ethical standards.

— *We have an obligation to see that associates uphold standards of the profession.* Burke advised: "When your associate has been unethical, illegal or unfair, advise the proper authority." If you do, be tactful, remembering unethical operations affect everyone adversely.

Coping with Program Management Interfaces

Routinely, the program manager interfaces with four types of people: superiors, subordinates, contractor personnel and the public/media. Each has peculiarities affecting program manager response.

First, the superior places special trust in the program manager assuming a sense of responsibility. The superior, source of the program manager's authority, must be informed of the program's key developments, and notified at the first sign of a change. This builds trust and keeps vital channels of communication open. The program manager should admit to an error as soon as possible. Above all, regardless of the program manager's feelings, the superior must be shown loyalty so the organization can function effectively.

Second, the program manager should deal with subordinates in an equally ethical manner, showing the honesty and fairness he expects from the superior. The program manager should give subordinates suitable attention, seek their participation, and be sincerely interested in their careers. A good program manager "tells it the way it is," handling reactions of subordinates in a frank manner.

Third, the program manager's relations with the contractor should be given special care. An adversarial relationship could find the program manager fighting for every inch of ground; avoid this situation. A cooperative spirit with the "win/win" attitude benefits both parties. Although information presented to contractors by the program manager may vary it should not differ in quality. The program manager should not forget the contractor is supporting the program, whose success is based on each organization performing to the utmost. Government and industry program managers have a common objective, accomplish the program successfully. Accordingly, the program manager and contractor should be equally responsive to requests from each other.

Fourth, the program manager should never forget the public and the media, recognizing he will be dealing with perceptions that can become realities. When the program manager faces a TV camera, radio microphone or a journalist, he will find the situation easier if there is nothing unethical to hide. This is where strong ethical conduct pays off, because "Honesty is the best policy"; perhaps "Honesty is the only policy." Lies will get any man into trouble, but honesty is its own defense.

In every situation, the program manager must be alert to responsible media wanting to provide an objective and truthful report to the public, as well as to irresponsible media who may not. Some media may relish roles as a counterforce to their views of malfeasance in government.

Steven J. Zaloga, author of magazine articles and more than 30 books on defense issues, said some cub reporters dream of "basking in the glory earned by a major investigative report of some government misdeed." The applause for Bob Woodward and Carl Bernstein by the press establishment and some schools of journalism has fostered journalism that is, according to Zaloga "solely concerned with negative, critical reporting on apparent government abuses...cheap and flashy scoops of leaked material seems much more appealing to much of the press than careful analysis of the wealth of defense information already available on an unclassified basis to the interested party." Institutional preferences for this style of reporting do not require a particular ideological bias to succeed.

As taxpayers, we can't criticize efforts to uncover government or defense industry corruption, but we should know that investigative journalism, regardless of defense matters, requires a high level of research and knowledge.

Ethics in Defense Industry

Former President Reagan's Blue Ribbon Commission on Defense Management, often referred to as the Packard Commission, completed its study in June 1986. A separate report prepared by commission member William P. Clark recommends that each company in the defense industry set up strict codes of ethics for employees.

In an interview following the study, Former Deputy Secretary of Defense Packard said, "The code of ethics would make it the responsibility of every individual (in a defense company) to know what good behavior is. They would have the opportunity to report anything they see without danger of retribution of any kind. We [the Packard Commission] think we can get the whole defense business dedicated to a higher level of performance and, hopefully, it will be self-sustaining and self-supporting."

We should not delude ourselves into thinking codes alone will dramatically improve ethical conduct. However, codes are enabling devices to strive for higher ideals and to record professional consensus. A code of practice is inherent in the very concept of professional life.

Codes of ethics have increased among defense contractors recognizing the need for an ethical statement employees can read, ponder and develop a sensitivity and awareness to. The need to emphasize strong ethical conduct is the result of wrongdoing in recent times, overpricing spare parts, misconduct in defense system contracting, bill-padding, influence-peddling, use of corporate funds for political purposes, and others.

Several years ago, Robert F. Allen, president of the Human Resources Institute, suggested seven key questions regarding ethical behavior in organizations.

—Is ethical behavior being rewarded or penalized by the organization, and in what ways?

—Is ethical behavior being visibly modeled by leaders within the organization?

—Are people receiving feedback and information relating to whether they are practicing good ethical behavior?

—Are day-to-day interactions and relationships among people supportive of good ethical behavior?

—Do formal and informal training programs in the organization emphasize good ethical behavior and offer skills in connection with it?

—How are new people in the organization being oriented to good ethical behavior?

—Are time and other resources in the organization allocated to show commitment to good ethical behavior?

Program managers in government and industry and their subordinates, who want to earn and retain respect, would do well to consider these questions and reflect on their responses.

Addressing the Georgia Bar on June 13, 1986, Deputy Defense Secretary William H. Taft IV cited the increasing number of suspensions and debarments and the concern of the Pentagon because "so much rides on the quality of the equipment received from our contractors." In 1981, there were 151 suspensions and debarments of DOD contractors. The number increased steadily and, in 1985, there were more than 600. Although these numbers are not large when one takes into account the total number of defense contractors, the increase is dramatic. Greater adherence to high standards of ethics "was and is our only motivation for increased use of suspensions and debarments," Taft explained. He added that "These are not punitive actions; they are positive steps in protecting the American people and ensuring the integrity of the defense companies with which we deal." Taft's views were included in Packard Commission recommendations for reform.

"Apart from the legal issue, the Department of Defense policy provides a prudent means for protecting the government," Taft said. He added that settlement agreements the Department of Defense negotiated with suspended contractors "demonstrate conclusively that this process protects the government, and encourages meaningful and enforceable standards of conduct and ethics in companies that previously lacked such high standards." The settlement agreements place an increased emphasis on restitution to the government including investigation costs, Taft remarked. More importantly, he said, they outline specific actions to be taken by the contractor to implement comprehensive ethics programs and internal audit and management controls, and to enforce them. Taft added that the settlements include provisions for outside oversight of a company's conduct.

Unethical Behavior

What influences unethical behavior? We learned managers look to bosses and colleagues for guidance when ethical dilemmas arise on the job. An American Management Association survey showed that the behavior of superiors and peers in the organization contributed most to

the ethical behavior and actions by managers. These choices ranked first and second, respectively, by the majority of respondents from all levels, regardless of age, gender or education. Ethical practices of one's industry or profession ranked third. Financial needs did not appear to be an important factor. These results were replicated in separate surveys made in 1961, 1976 and 1982.

How do managers handle unethical behavior? What factors should a manager consider in making a judgment? Finding answers to these questions is a difficult task. Few people are willing to divulge their attitudes on this subject for fear it might incriminate them or their friends.

When unethical behavior appears to be involved in a given situation, a good manager will determine whether this is true, or whether the action only has the appearance of being unethical. It is important the manager verifies information before taking action. Most managers believe they are more ethical than their business colleagues. This has been verified in numerous studies.

When Richard F. Schubert was president of Bethlehem Steel, he said "...management has to do more than establish codes of conduct. It has a primary responsibility to motivate and inspire employees to conduct themselves honestly and fairly. Starting at the top...it has to set the example for others to follow by acting in a morally proper way."

Closing Thoughts

Public confidence in government, industry and business depends on congruence between executive behavior and the values and aspirations of organizations and the general public. The "scandals" exposing weaknesses in American ethical behavior have, at the same time, shown the strengths of this country's foundation. Citizens have not lost confidence in the system, but have become dismayed by the way it is operating. Therefore, while there may be no authoritative interpretation of management ethics, managers must accept the obligation to keep in touch with U.S. citizens. The active pursuit of enhanced accountability through codes of ethics and other means is a basic ingredient to the restoration of public trust.

Managers in government and industry setting high standards and willing to let people judge them by these standards will probably succeed, all other leadership qualifications being equal. They recognize that when a manager compromises to gain, he eventually loses.

One's belief influences what one becomes; a statement of belief can describe a person or a history of ideas. I hope this creed (author unknown) will have a special meaning for you, as it does for me.

> I believe in the greatness of the individual, and that I am in this world for a purpose, that purpose being to put back into life more than I have taken out. I believe in the integrity of other people, assured that they try as hard to follow the gleam, even as I. I believe in the gallantry of older people whose seasoned experience and steadfast devotion have preserved for me the heritage of the past. I believe in the magnificence of the past, knowing that without its storied wealth

I would possess nothing. I believe in the challenge of the future, fully realizing there will be no future except it becomes alive through me. I believe in the contagion of health, and that I can spread it through cheerfulness, wholesome habits, sensible expenditure of energies, and wise use of foods. I believe in the nobility of work as the creative expression of the best within me, and as my share is easing the common load of all. I believe in the enrichment of play and laughter as the means of cleansing my body of staleness and my soul of bitterness. I believe in God, who justifies all these beliefs; He is the still, small voice within, ever urging me toward the unattained. And whatever more I believe entwined in those precious feelings that lie too deep for words.

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EPILOGUE

Every segment of the defense acquisition community – government, industry, and the Congress – is involved in the quest for the best in defense systems.

In an article by former Secretary of Defense Frank C. Carlucci on the subject, "A Quest for Excellence," he indicated the quest requires the acquisition community be guided by three underlying principles:

1. The essential need for stability in defense funding, planning and acquisition.

2. A new approach to quality which will structure, integrate and coordinate acquisition improvement programs into a single drive for excellence.

3. A true partnership among the Department of Defense, industry and the Congress.

These principles, of course, are not discrete goals, but progress made in one area is directly related to the success in the other two areas.

The most difficult task appears to be that of obtaining program stability. When constraints are placed on the defense budget, some carefully considered choices need to be made. Such past practices as stretching out programs and buying fewer units at a greater cost per unit cannot be tolerated. On the other hand, the overall cuts in the defense system programs must be made so it will not jeopardize our national security. What we need to deploy today is a smaller, fully-equipped and well-trained force. We will be able to obtain the stability we need if there is better cooperation between the executive branch of our government and the Congress, as well as between the government and industry.

The overall acquisition process has been improved. A five-year funding target has been established as well as a two-year budget. In the more predictable defense acquisition atmosphere, industry should be able to make long-range investments, resulting in cost-cutting and productivity gains. Regulatory reforms, including the writing of contracts, specifications and standards, are under way.

Total quality management, which has a great potential payoff, is being given the attention it deserves, and a consorted effort is being made to avoid waste of any kind. Attention is being placed on modern techniques such as value-added concepts in production. Spare parts, servicing techniques, test equipment, manuals and other logistic support items make up between 40 and 50 percent of a defense system's life-cycle cost; therefore, if the original product is of high quality, logistic support costs can be minimized. Total quality management is a key acquisition strategy that can affect a permanent change in the success of a defense acquisition system.

A Plan to Improve the Defense Acquisition Process

In his February 1989 address to a Joint Session of Congress, President Bush announced he was directing the development of "a plan to improve the defense procurement process and management of the Pentagon." Specific terms of reference for this purpose called upon the DOD to "develop a plan to accomplish full implementation of the recommendations of the Packard Commission and to realize substantial improvements in defense management overall."

President Bush directed specific actions be identified in four broad areas: (1) personnel and organizations, (2) defense planning, (3) acquisition practices and procedures, and (4) government-industry accountability. The president called for recommended "actions the Congress could take which would contribute to the more effective operation and management" of DOD.

The resulting defense management review examined the various efforts made to date, to realize the far-reaching improvements envisioned by the Packard Commission in its reports and by Congress in the Goldwater-Nichols Defense Reorganization Act of 1986.

While there has been some progress since then, the progress to date gives cause for hope that the necessary consensus and commitment can be sustained. Secretary of Defense Cheney, who took office March 1989, said this will be essential if the U.S. defense effort is to be managed in a manner that:

> Ensures the continued strength and readiness of the nation's armed forces;
>
> Helps us acquire needed new weapon systems at less cost, in less time and with greater assurance of promised performance;
>
> Encourages industry and government alike to meet the highest standards of integrity and performance; and
>
> Promotes greater public confidence in our stewardship of defense resources.

Continuing, Secretary Cheney said:

> If we are to continue to protect our global interests, meet our responsibilities and minimize the risks to our security, we must preserve essential military capabilities through ever more skillful use of the resources at our disposal.
>
> Such circumstances compel the utmost attention to prudent management of our defense program — and oblige the executive branch, Congress and industry as seldom before to join in husbanding available defense dollars, cutting unnecessary costs and achieving new levels of productivity and quality.

According to Secretary Cheney:

> The deputy secretary of defense will assist in overall leadership of DoD and exercise delegated authority on all authorized matters. He will be responsible for day-to-day management of DoD and operation of a more rigorous Planning, Programming and Budgeting System designed to produce a coherent, integrated and efficient defense program. He will have day-to-day responsibility, with the secretary, for ensuring the full implementation of approved actions under the defense management review.
>
> The under secretary of defense for acquisition will exercise the authority intended by the Packard Commission and provided in law — responsibility for policy, administration, oversight and supervision of acquisition matters DOD-wide. In this regard, his authority will extend to directing the secretaries of the military departments on the manner in which acquisition responsibilities are executed by their departments.
>
> The under secretary of defense for acquisition will have the full confidence and active support of the secretary and deputy secretary as principal staff assistant on such matters, including implementation of numerous initiatives stemming from the defense management review. The role of the under secretary of defense for acquisition within DOD will be enhanced in certain respects, among them the following: serving as a key participant in all phases of the Planning, Programming and Budgeting System, including deliberations on major budget issues; and administering the selected acquisition reports and other congressional reporting on acquisition programs and issues."

DOD Executive Committee. Under the chairmanship of the SECDEF, the DEPSEC, USD(A), Secretaries of the military departments, USD(P) and Chairman of the Joint Chiefs of Staff will comprise the membership of a new executive committee. The executive committee will meet regularly and serve as the key, senior deliberative and decision-making body within DOD for all major defense issues.

Defense Planning and Resources Board. The DEPSEC will manage the PPBS as Chairman of a Defense Planning and Resources Board, which replaced the DRB. It will have the following permanent members: Chairman of the Joint Chiefs of Staff, USD(A), Secretaries of the military departments, USD(P), Assistant Secretary of Defense for Program Analysis and Evaluation and the DOD comptroller. As matters on the agenda dictate, other senior military and civilian officials will be called upon to participate in the board's deliberations.

Planning Process. Responding to the Packard Commission's recommendations and the mandate of the Goldwater-Nichols Act will require substantial improvements in the threshold, or planning, phase of the PPBS.

In the spring of the year prior to DOD's program and budget reviews, the Secretary, on the advice of the DPRB, will issue guidance on a limited number of planning topics to be considered and resolved. The DPRB or a select group of its members as designated by the DEPSEC will meet through the spring and summer to develop recommendations on these issues for consideration by the Secretary before August 1 and for subsequent communication to the military departments and defense agencies.

The USD(P) will include these and other issues as specific planning guidance in the restructured Defense Planning Guidance, which the Secretary will formally issue by October 1 of the year preceding the programming phase.

Defense Acquisition Board. The USD(A) and the Vice Chairman of the Joint Chiefs of Staff, as Chairman and Vice-Chairman respectively, will direct the efforts of a streamlined DAB. The board's permanent membership will be reduced, as will its committee and *ad hoc* working structures.

The DAB will rigorously oversee major systems acquisition to ensure the acquisition process is managed in a manner consistent with DOD policy. That policy will define minimum required accomplishments and permit additional program-specific exit criteria to be established by the USD(A) at each milestone in a system's life. The paramount objective of the USD(A) will be to discipline the acquisition system through review of major programs by the DAB. This review will be calculated to ensure every program is ready to go into a more advanced stage of development or production prior to receiving milestone approval and the plans laid for such stages are consistent with sound acquisition management.

To forge strong links between the DPRB and the DAB, the USD(A) will serve as a key adviser to the SECDEF and the DEPSEC on all resource decisions affecting acquisition program baselines.

By August 1, 1989, the USD(A) and DOD comptroller will submit their recommendations to the DEPSEC concerning the assumption by the DAB of responsibility for major automated data processing systems acquisition currently exercised by the Major Automated Information System Review Council.

Defense Acquisition

Major challenges remain to be addressed on the defense acquisition system if DOD is to implement fully the Packard Commission's recommendations in this area. This includes the various organizational arrangements, personnel improvements and revised practices and procedures projected by the commission to reduce the cost and improve the performance of new weapon systems.

Clear Command Channels. Positioning the USD(A) as DOD's senior, full-time acquisition executive was but one part of the commission's approach to acquisition management. No less

central was the need to establish clear, abbreviated lines of authority within the Services for performing their traditional role of managing major new programs.

The military departments have taken different approaches to implementing the commission's concept and have had varying degrees of success. None has fully met the commission's purposes, and a careful review of their efforts to date indicates a need for revising their acquisition organizations in several respects.

A civilian official, at the Assistant Secretary level within each military department, will be designated the Service acquisition executive and have full-time responsibility for all Service acquisition functions. These functions will be conducted within Service Secretariats in a manner ensuring effective civilian control and will not be duplicated in Service chiefs' organizations.

The Service acquisition executive will manage all major acquisition programs through program executive officers, each of whom will have a small, separate staff organization and devote full-time attention to managing assigned programs and related technical support resources.

On all matters of program cost, schedule and performance, program managers will report only to their respective program executive officer or Service acquisition executive.

Consistent with this structure, these Service commands will be organized with a primary focus on three roles: providing necessary logistical support; to the extent appropriate, managing programs other than those conducted under the program executive officer structure; and providing a variety of support services to program executive officers and program managers, while duplicating none of their management functions. The Secretaries of the military departments and Service acquisition executives will be charged with ensuring Service commands perform these various roles in a fully accountable manner.

The Secretaries of the military departments and Service chiefs will ensure maximum accountability within the program executive officer structure. Program executive officers will be selected by the Secretaries of the military departments with the advice of the Service acquisition executives who will have primary responsibility for evaluating program executive officers' job performance. Similarly, Service acquisition executives and program executive officers will advise on the selection of program managers and evaluate them. In addition, funding and personnel authorizations for offices of program executive officers and those of the program managers reporting to them will be administered separately from Service commands.

Stability in Programs. Important economies flow from conducting major systems acquisition in an environment of stable funding and management; the likelihood that systems will be delivered on time and at projected cost greatly increases with reliable planning, funding and system configuration, and continuity in management personnel. Reaching and adhering to baseline agreement on factors critical to a program's success, contracting for procurements over two or more years and maintaining economical rates of production — these and other techniques have been proven to yield substantial savings over the life of a system.

The budget environment will make it more difficult, but altogether more important, that DOD avail itself of these means to stretch its modernization resources. For this reason, senior acquisition officials will serve as key advisers on resource decisions affecting the baselines of major acquisition programs and on alternatives that may mitigate the impact of such actions.

Limited Reporting Requirements. The acquisition system has been encumbered by overly detailed, confusing and sometimes contradictory laws, regulations, directives, instructions, policy memoranda and other guidance. Little room remains for individual judgment and creativity of the sort on which the most successful industrial management increasingly relies to achieve higher levels of productivity and lower costs. Much of this stifling burden is a consequence of legislative enactments and urgently requires attention by the Congress. Much also has been administratively imposed and requires prompt corrective action by the DOD.

To reduce the self-imposed burden, a joint OSD-Services task force will be chartered to conduct a zero-based review of regulatory and other guidance to DOD's systems acquisition, procurement, logistics and related activities, beginning with DOD-level guidance and proceeding down through the military departments and their components. The review will include existing guidance and that which is currently under development.

The task force also will assess the processes by which guidance is developed, issued and disseminated, and recommend changes to ensure future guidance is held to the minimum. The task force will be assembled by the USD(A).

Smaller, Higher-Quality Staffs. Approximately 580,000 civilian and military personnel in DOD spend all or a substantial part of their workdays in the acquisition field — broadly defined to include research, development, procurement, logistics, distribution and related maintenance activities. Their collective efforts form a core part of the U.S. defense program, and much depends on how efficiently and effectively they equip and supply our armed forces.

While small improvements have been made in the nearly three years since the Packard Commission completed work, its major recommendations have yet to be implemented. Identifying steps to accomplish the commission's broad objectives in this area accordingly has been a major focus of the defense management review.

The DOD will seek to increase the professionalism of its procurement work force to make its employees' capabilities and career opportunities more competitive with those of their private sector counterparts.

In addition, all DOD contract administration services, including those performed in the Defense Logistics Agency and the military departments, will be consolidated under a newly created Defense Contract Management Agency, with the objective of more efficiently and effectively performing the contract administration services function. It will report to the USD(A), who will assist the DEPSEC in preparing a plan to establish the Defense Contract Management Agency. This plan will, among other things, seek to streamline existing contract administration

services organizations, promote uniform interpretation of acquisition regulations, improve implementation of DOD procurement policy and upgrade the quality of the contract administration services work force while eliminating overhead and reducing payroll costs.

Annually, the DAB will review mission needs identified by the JROC for possible Milestone 0 approval. Those candidates passing through this restructured Milestone 0 would not be considered programs in the traditional sense; instead, at this threshold, the USD(A) will authorize concept direction studies to evaluate potential alternative approaches to meeting validated, priority needs. The USD(A) will coordinate the funding of concept direction studies, resources for which may come from one or more military departments, a central fund controlled by the USD(A), or both. More concept direction studies may be undertaken than will be carried forward past Milestone I (Concept Approval). Particular care will be exercised at Milestone I to ensure concept approval is given to no more new programs than long-term resources available to DOD will support. To provide for programs that do enter the post-Milestone I phase, outyear resources for such purposes will be roughly aggregated at the DOD-wide level and, following concept approval by the DAB, allocated by the DPRB to specific new programs.

Better System Development. Decisions made during the early phases of systems development — including those involving funds and schedules for prototyping and testing — often have dramatic consequences for operational performance and life-cycle cost. The USD(A) will be charged with developing and ensuring rigorous application of policies supporting sound decisions on major programs through full-scale engineering development.

The DAB review process will be restructured and disciplined. As prospective programs pass out of the concept direction (post-Milestone 0) phase, the USD(A) will convene a DAB Milestone I (Concept Approval) review of requirements/costs trade-offs, initial affordability assessments and other minimum accomplishments required by DOD directive. Defense Acquisition Board Milestone II (Full-Scale Engineering Development) and III (Production) reviews will ensure that other, progressively more exacting requirements are met. A redefined Milestone IV will replace the current Milestones IV and V. The new Milestone IV review will address the need for major upgrades or modifications to systems still in production.

In conjunction with the DOD comptroller, the USD(A) or his principal deputy will exercise so-called apportionment authority with respect to funding for programs passing through successive milestone reviews to ensure demonstrable attainment of minimum required accomplishments established in revised DOD directives and the successful completion of all additional exit criteria levied on programs as a result of previous DAB reviews. Only the SECDEF, the DEPSEC and the USD(A) will have the authority to waive such requirements and exit criteria.

In general, USD(A) will be responsible for improving the timeliness, relevance and utility of the selected acquisition reports, the defense acquisition executive summaries and other information on acquisition matters available to senior DOD managers.

Constrained research and development resources will pose special challenges to maintenance of a strong defense technology base. The USD(A) will be charged with coordinating research and development programs DOD-wide to eliminate duplication of effort and ensure that available resources are used to maximum advantage.

The USD(A) will be charged with expediting implementation of administrative actions recommended by the Defense Science Board task force and will also establish a data base to track progress DOD-wide in expanding procurement of commercially available products.

The work of the Defense Science Board's task force demonstrates that realizing large cost savings through procurement of commercially available products will require simplified contracting procedures.

Government-Industry Relationship

Any effort to improve the relationship of government and defense industry must be rooted in a basic position: DOD will not tolerate illegal or unethical behavior on the part of anyone in the acquisition system.

Greater Accountability in Government. The President, the President's Commission of Federal Ethics Law Reform and the Congress have spoken to the important need for training and educating government employees in their ethical responsibilities.

Particularly when considered against the range of expectations, DOD ethics programs appear notably deficient. For too long, such programs have been at best a secondary concern of DOD managers and relegated instead to lawyers and inspectors general. Consistent with the President's emphasis on integrity in government, DOD will commit the energy and resources required for a model ethics program – particularly for acquisition personnel. A senior-level, DOD ethics council will be chartered for this purpose.

Greater Accountability in Industry. Within the context of vigorous law enforcement, contractor self-governance remains the most promising additional mechanism to foster compliance with the high standards expected of DOD's suppliers.

The DOD will oversee the acquisition system in ways calculated to encourage responsible companies in such self-governance efforts, including establishment of corporate codes of conduct. If such codes are to be a meaningful reflection of management's priorities and commitment, however, it is apparent they must be adopted by contractors voluntarily, not mandated in procurement regulations. Like quality, ethics cannot be inspected into an organization.

The DOD will continue its voluntary disclosure program, under which DOD contractors are encouraged to demonstrate their business integrity and honesty by disclosing evidence of possible procurement offenses. To reduce the possibility of inconsistent treatment of defense industry disclosures, the DOD will work with the attorney general to adopt and publish a standard

agreement for program participation. In addition, to create clear incentives for corporate management, voluntary disclosure of potential violations will remain a central consideration in determining a contractor's responsibility to do business with DOD and, hence, in application of DOD's administrative sanctions (i.e., suspension or debarment).

Better Performance by Industry. There is, of course, more to creating a healthy relationship between government and industry than defining ethical responsibilities. There is also a need to promote robust industrial support for the U.S. defense program and to prompt defense industry to greater competitiveness and to the simultaneous quality improvements and cost reductions achieved in other industrial sectors.

Current trends are cause for concern and, if allowed to continue, will jeopardize U.S. security. If these trends are to be reversed, the acquisition system must be managed in ways that promote improved supplier performance and a resurgent defense industrial base. Ultimately, only broad reform of the acquisition system, including the legal regime and oversight practices under which it operates, will attract more U.S. firms to do business with DOD. In the near term, DOD will encourage better performance by defense contractors through a series of actions.

The DOD will establish contractual relations that do not create financial disincentives to the degree of innovation and technical exploration clearly required by contractors in the early phases of major systems development to achieve proper operational performance and lower life-cycle cost. In addition to promoting the use of multiyear procurement contracts, the USD(A) will strictly limit the use of cost-sharing contracts for systems development and the use of fixed-price-type contracts for high-risk development. Approval of the USD(A) will be required for any fixed-price-type research and development contracts in excess of $25 million as well as those for lead ships.

The USD(A) also will be charged with helping to promote the long-term, efficient producibility of systems. With the vice chairman of the Joint Chiefs of Staff, he will seek to expand the use of broad performance specifications in weapons design and ensure that specifications are "locked in" prior to high-rate production and that upgrades or modifications are made on a block, not piecemeal, basis.

As a complement to DOD's own efforts, research and development by defense suppliers helps encourage technological innovation, stimulate competition and expand the availability of militarily valuable products. The DOD will continue to recognize costs incurred by suppliers for independent research and development and bid and proposal as necessary costs of doing business. Through the DPRB, it will maintain appropriate levels of funding to defray such costs and thereby promote development of promising technologies to meet future defense needs.

The DOD also will review periodically the level of progress payments on defense contracts and maintain such payments at levels appropriate in light of prevailing interest rates and restraints on current DOD outlays. It also will use the tools at its disposal to motivate contractors

to improve performance (through incentive-type contracts) and productivity (through profit guidelines that encourage capital investments).

The USD(A) will develop a quality awards program that annually recognizes top industry performers in terms of meeting cost, performance and schedule baselines and exhibiting high commitment to ethical management.

Congressional Actions

The DOD, with other elements of the executive branch, can realize significant improvements in defense management. This review has sought to take full advantage of opportunities for administrative action, but also demonstrates these opportunities are limited.

Changes in Legislation. The review has identified a variety of specific actions by the Congress that would assist in better management of the acquisition system. In addition to those treated earlier, one additional initiative deserves special emphasis: the increased urgency to address the body of procurement law in its totality. The framework under which DOD and other departments operate needs to be simplified and clarified to restore some breathing space for the judgment and incentive necessary to make the acquisition process fundamentally more effective.

Broader Congressional Reforms. The Congress plays a central role in formulating and implementing U.S. defense policy. Much depends on the way in which it exerts its authority and how well or poorly it carries out its responsibilities.

The intense scrutiny recently paid to DOD organization and management has occasioned a growing conviction that the procedures by which the Congress today does its work require careful and thorough reexamination, as do the various ways in which the Congress, its staff and congressional agencies influence DOD operations.

Final Thoughts

Experience has shown that properly applied program management disciplines will provide:

- Uniformity in the manner in which the customer expresses his requirements to the contractor

- Uniformly structured responses from the contractor that can be accurately evaluated by the customer

- For subdivision of large system/end product programs into manageable packages that can be contracted, funded, and controlled incrementally

- Technical bases for contracts that can adequately support statements of work and, thus, generate more accurate cost and schedule estimates

—Controls commensurate with the magnitude of financial commitments and the risks involved

—Controls that can be expanded to match the depth and firmness of information.

In the final analysis, it becomes quite clear that the successful development and deployment of any new system/end product depends on many factors. Of primary importance is the employment of competent people who are given the responsibility, along with the authority, to accomplish the task. Program objectives must be realistic, but some flexibility to make changes and trade-offs must be granted to program management. Risks must be identified early, fully understood, accommodated and promptly reduced. The customer and contractor program management teams must recognize that each program is different. Further, they must freely communicate knowledge, information and data pertinent to the achievement of program objectives. Finally, the members of these teams must be highly motivated to achieve the program objectives.

It should be borne in mind that the contract type determines the degree of formality required on a program. A good manager will never invoke more formality than required by contract, unless the anticipated results appear to be worth the expenditure of additional resources.

References

1. Frank C. Carlucci, Secretary of Defense, "A Quest for Excellence," *National Defense*, April 1988, pp. 23, 26.

2. Dick Cheney, Secretary of Defense, "A Plan to Improve the Defense Acquisition Process," *Defense '89 Acquisition Management*, pp. 1-19.

APPENDIX A

Appendix A

ABBREVIATIONS AND ACRONYMS

A	AAG	Acquisition Advisory Group
	ACO	Administrative Contracting Officer
	AEA	American Electronic Association
	AIA	Aerospace Industries Association
	AID	Agency for International Development
	AIMS	Acquisition Information and Management System
	AMARC	Army Material Acquisition Review Committee
	ARPA	Advanced Research Projects Agency
	ASD	Assistant Secretary of Defense
	ASPR	Armed Services Procurement Regulation
B	BOB	Bureau of the Budget
C	CAIG	Cost Analysis Improvement Group
	CALS	Computer-Aided Acquisition and Logistics Support
	CAMP	Center for Acquisition Management Policy at DSMC
	CCB	Change Control Board
	CCB	Configuration Control Board
	CICA	Competition in Contracting Act
	CIR	Cost Information Report
	CITIS	Contractor Integrated Technical Information System
	CM	Configuration Management
	CODSIA	Council of Defense and Space Industry Associations
	CRAG	Contractor Risk Assessment Guide
	C/SCSC	Cost/Schedule Control Systems Criteria
D	DAC	Defense Acquisition Circulars
	DAE	Defense Acquisition Executive
	DAR	Defense Acquisition Regulation
	DARS	Defense Acquisition Regulatory System
	DCAA	Defense Contract Audit Agency
	DCP	Development Concept Paper; later, Decision Coordinating Paper
	DDR&E	Director of Defense Research and Engineering
	DEPSECDEF	Deputy Secretary of Defense
	DFAR	DoD Federal Acquisition Regulation Supplement
	DIA	Defense Intelligence Agency
	DID	Data Item Description
	DLA	Defense Logistics Agency

	DMR	Defense Management Review
	DOD	Department of Defense
	DRB	Defense Resources Board
	DRMS	Defense Resources Management Study
	DSA	Defense Supply Agency
	DSARC	Defense Systems Acquisition Review Council
	DSB	Defense Science Board
	DSMC	Defense Systems Management College
	DSMS	Defense Systems Management School
	DTACCS	Director of Telecommunications and Command and Control Systems
	DTC	Design to Cost
	DWSMC	Defense Weapon Systems Management Center
E	EIS	Economic Information System
F	FAC	Federal Acquisition Circular
	FAI	Federal Acquisition Institute
	FAR	Federal Acquisition Regulation
	FMS	Foreign Military Sales
	FSD	Full-Scale Development
	FYDP	Five Year Defense Program
G	GAO	Government Accounting Office
H		
I	I&L	Installations and Logistics
	IDEA	International Defense Education Arrangement
	IG	Inspector General
	ILS	Integrated Logistics Support
	IMIP	Industrial Modernization Incentives Program
	IMS	Information Management System
	IPS	Integrated Program Summary
	ISA	International Security Affairs
	ISA	International Security Agency
	IWSDB	Integrated Weapon System Data Base
J	JCS	Joint Chiefs of Staff
	JLC	Joint Logistics Commanders
	JMSNS	Justification for Major System New Start
	JSOP	Joint Strategic Objectives Plan

K		
L	LCC	Life-Cycle Cost
M	ManTech	Manufacturing Technology
	MAP	Military Assistance Program
	MENS	Mission Element Needs Statement
	MND	Mission Need Determination
	MOA	Memorandum of Agreement
	MRA&L	Material Resources, Acquisition and Logistics
	MRF	Milestone Reference File
N	NATO	North Atlantic Treaty Organization
	NMARC	Navy/Marine Corps Acquisition Review Committee
	NSA	National Security Act
	NSC	National Security Council
	NSIA	National Security Industrial Association
O	OFPP	Office of Federal Procurement Policy
	OMB	Office of Management and Budget
	OMS	Operations Management System
	OPM	Office of Personnel Management
	OSD	Office of the Secretary of Defense
	OT&E	Operational Test and Evaluation
	OUSD	Office of the Under Secretary of Defense
	OUSDRE	Office of the Under Secretary of Defense Research and Engineering
P	PA&E	Program Analysis and Evaluation
	PCAP	Pilot Contracting Activities Program
	PDM	Program Decision Memorandum
	PE	Procurement Executive
	PM	Program Manager
	PMC	Program Management Course at the Defense Systems Management College
	PMO	Program Management Office
	POM	Program Objectives Memorandum
	PPBS	Planning, Programming, Budgeting System
Q	QA	Quality Assurance
R	R&D	Research and Development
	R&E	Research and Engineering
	RDT&E	Research, Development, Test and Evaluation

	RMS	Resource Management Systems
	RSI	Rationalization, Standardization, and Interoperability
S	SA	Systems Analysis
	SAIMS	Selected Acquisitions Information and Management System
	SAR	Selected Acquisition Report
	SARC	System Acquisition Review Council
	SCP	System Concept Paper
	SDDM	Secretary of Defense Decision Memorandum
	SECDEF	Secretary of Defense
	SMAG	Systems Management Analysis Group
	SOW	Statement of Work
T	T&E	Test and Evaluation
	TEMP	Test and Evaluation Master Plan
	TPP	Total Package Procurement
	TQM	Total Quality Management
U	USD	Under Secretary of Defense
	USDRE	Under Secretary of Defense for Research and Engineering
V	VE	Value Engineering
W	WBS	Work Breakdown Structure
	WSEG	Weapons Systems Evaluation Group
X		
Y		
Z	ZBB	Zero-Base Budgeting

APPENDIX B

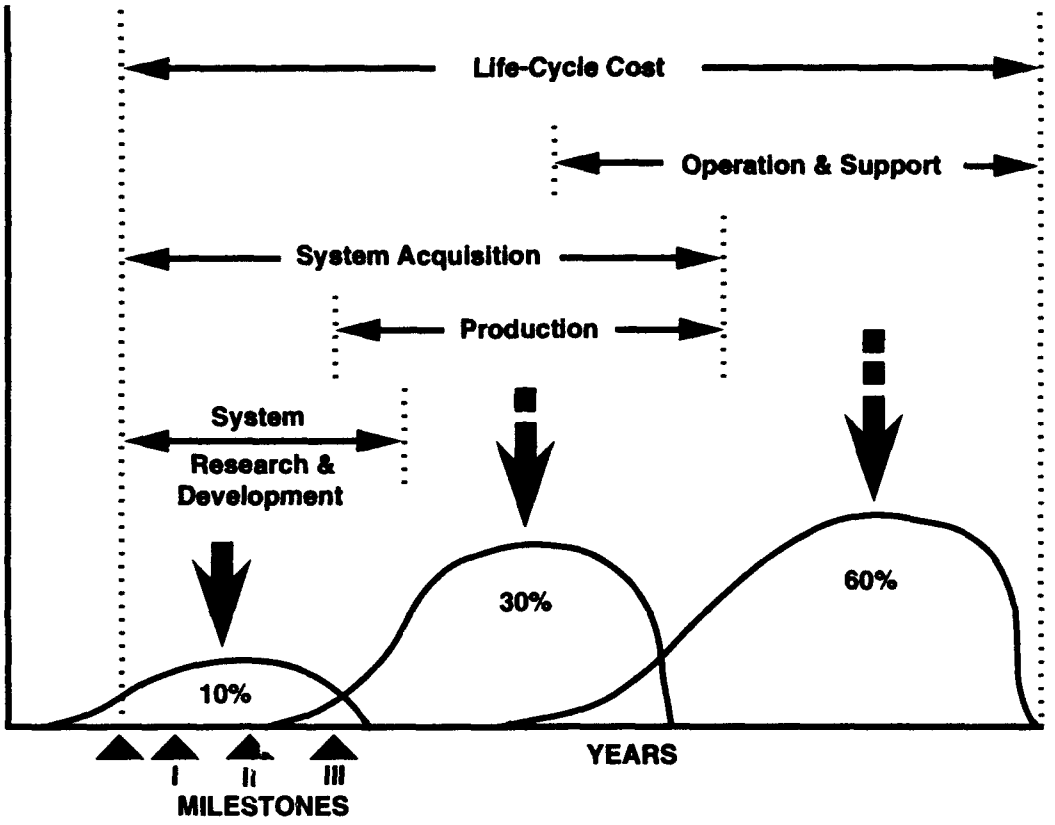
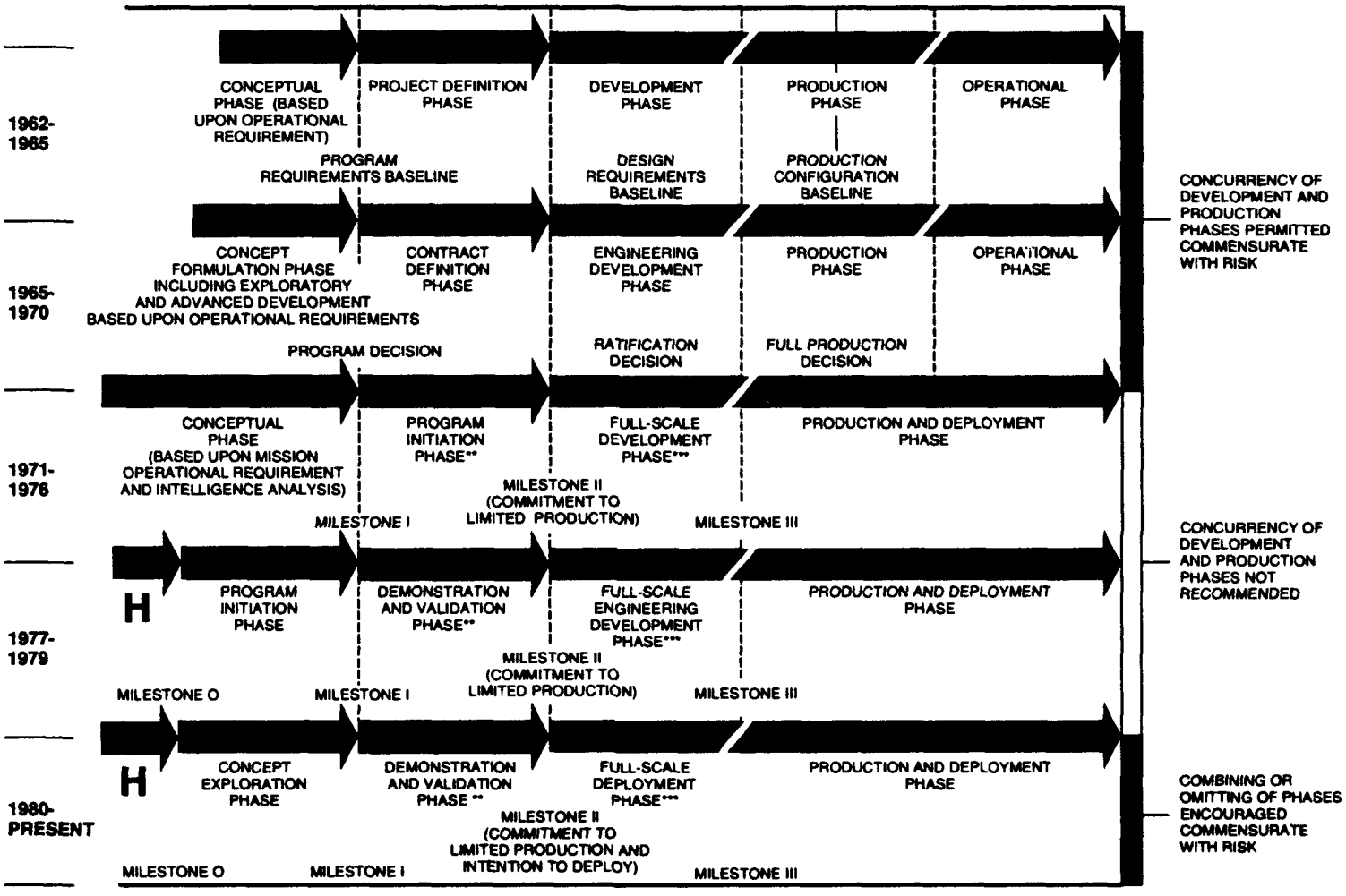


Figure 1. Typical System Life-Cycle Cost Distribution



*DETERMINATION OF MISSION ELEMENT NEED
**SUCCESSFUL DEVELOPMENT TEST AND EVALUATION REQUIRED BEFORE MILESTONE II.
***SUCCESSFUL OPERATIONAL TEST AND EVALUATION REQUIRED BEFORE MILESTONE III.

NOTE: SECDEF APPROVAL REQUIRED TO PASS MILESTONE O. SECDEF APPROVAL, FOLLOWING DSARC RECOMMENDATION REQUIRED TO PASS MILESTONE I, II, III.

Figure 2. Concept to Operational Phases, 1962 – Present

PROGRAM 1 **STRATEGIC FORCES**
Strategic offensive forces: strategic defense forces: civil defense; the command organizations associated with the strategic forces.

PROGRAM 2 **GENERAL PURPOSE FORCES**
All of the force elements not assigned to Program 1; the command organizations associated with these force elements; logistics and support units.

PROGRAM 3 **INTELLIGENCE AND COMMUNICATIONS**
Resources for intelligence and security; communications systems; specialized missions such as aerospace rescue/recovery, oceanography, weather service.

PROGRAM 4 **AIRLIFT AND SEALIFT**
Industrially funded and nonindustrially funded transportation organizations; water terminals; traffic management.

PROGRAM 5 **GUARD AND RESERVE FORCES**

PROGRAM 6 **RESEARCH AND DEVELOPMENT**
Research, exploratory development, advanced development, engineering development, management and support, operational systems development.

PROGRAM 7 **CENTRAL SUPPLY AND MAINTENANCE**
Activities are not organic to elements of the other programs.

PROGRAM 8 **TRAINING, MEDICAL, AND OTHER GENERAL PERSONNEL ACTIVITIES**
Training not identified with elements of other programs.

PROGRAM 9 **ADMINISTRATION AND ASSOCIATED ACTIVITIES**
Major administrative headquarters, field commands, construction support, the Defense Contract Audit Agency (DCAA).

PROGRAM 10 **SUPPORT OF OTHER NATIONS**
Support of Allies, the Military Assistance Program (MAP), the Agency for International Development (AID), similar activities.

Figure 3. Ten Major Programs of the Five Year Defense Program (FYDP)

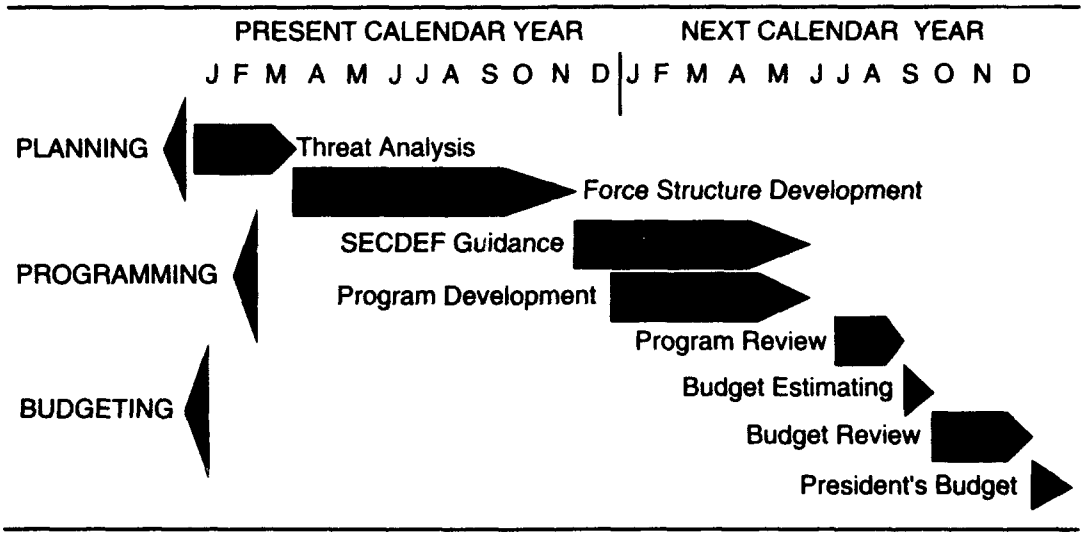


Figure 4. Planning, Programming, Budgeting System

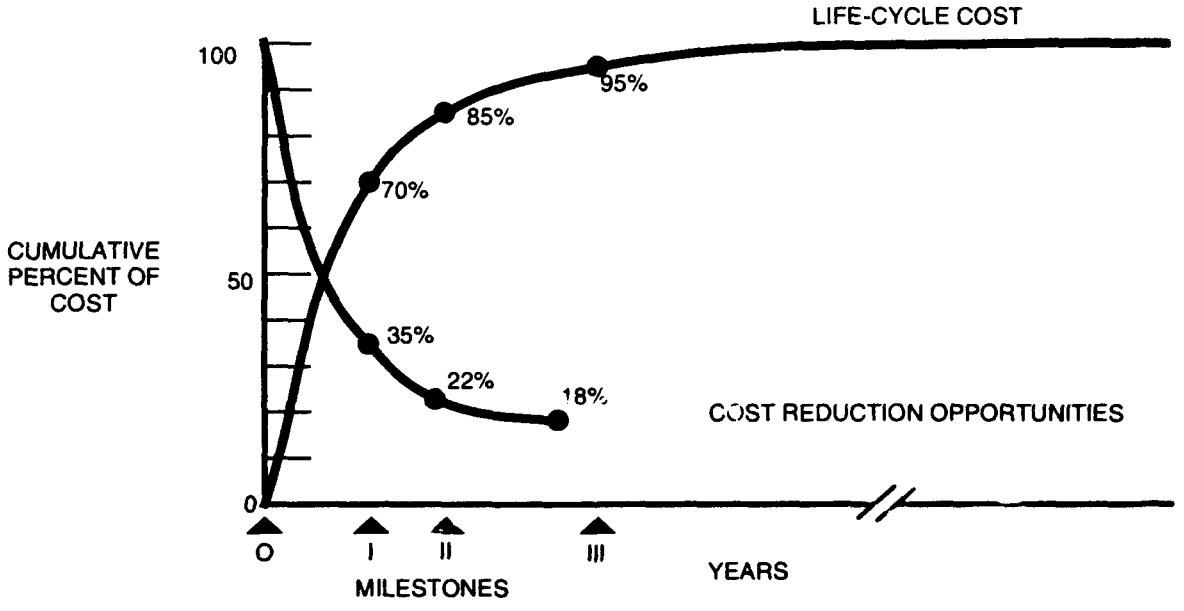


Figure 5. The Influence of Time and Program Manager's Ability to Curb Costs

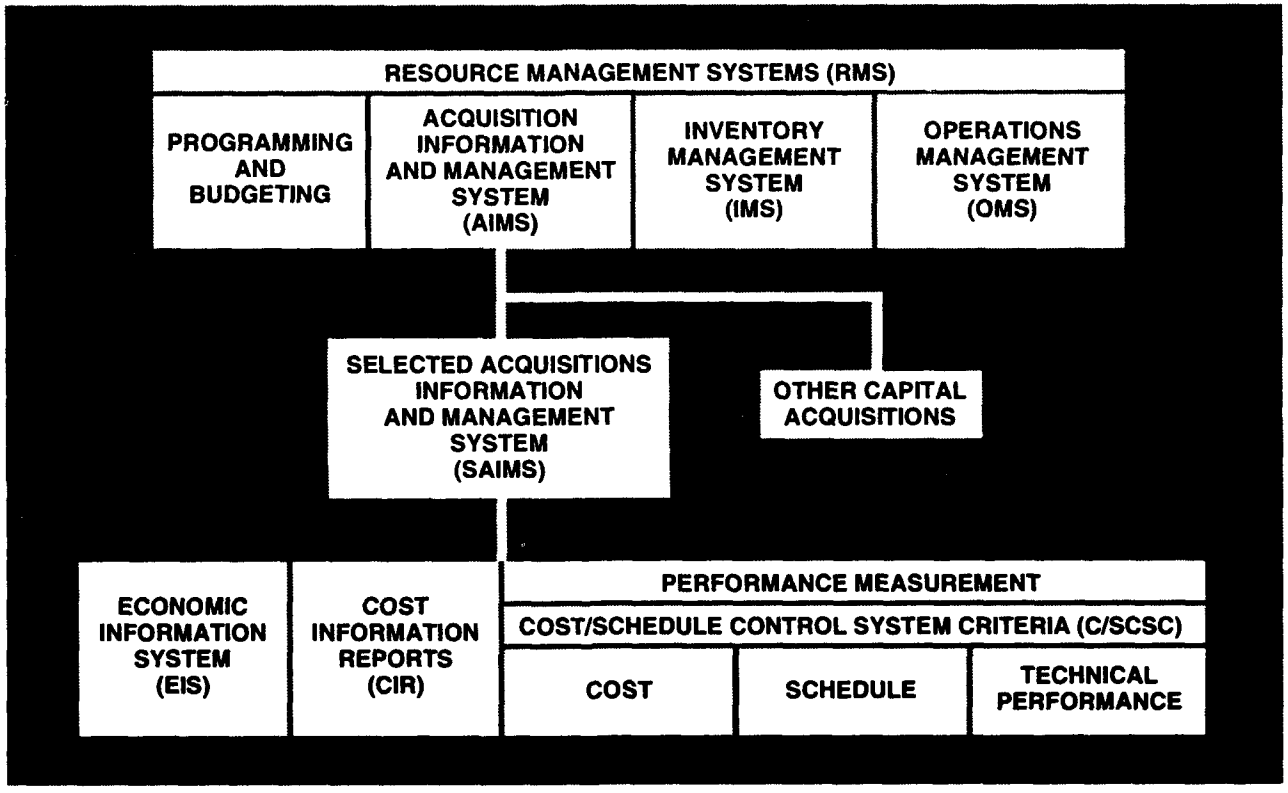
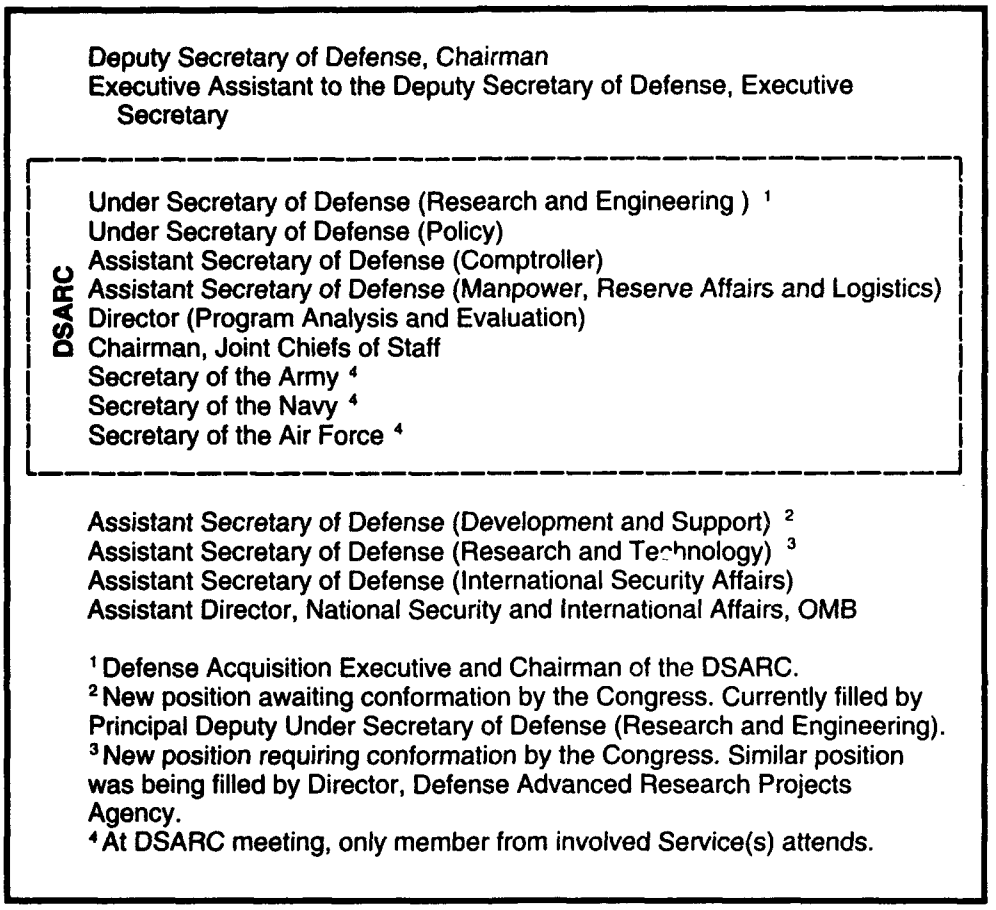
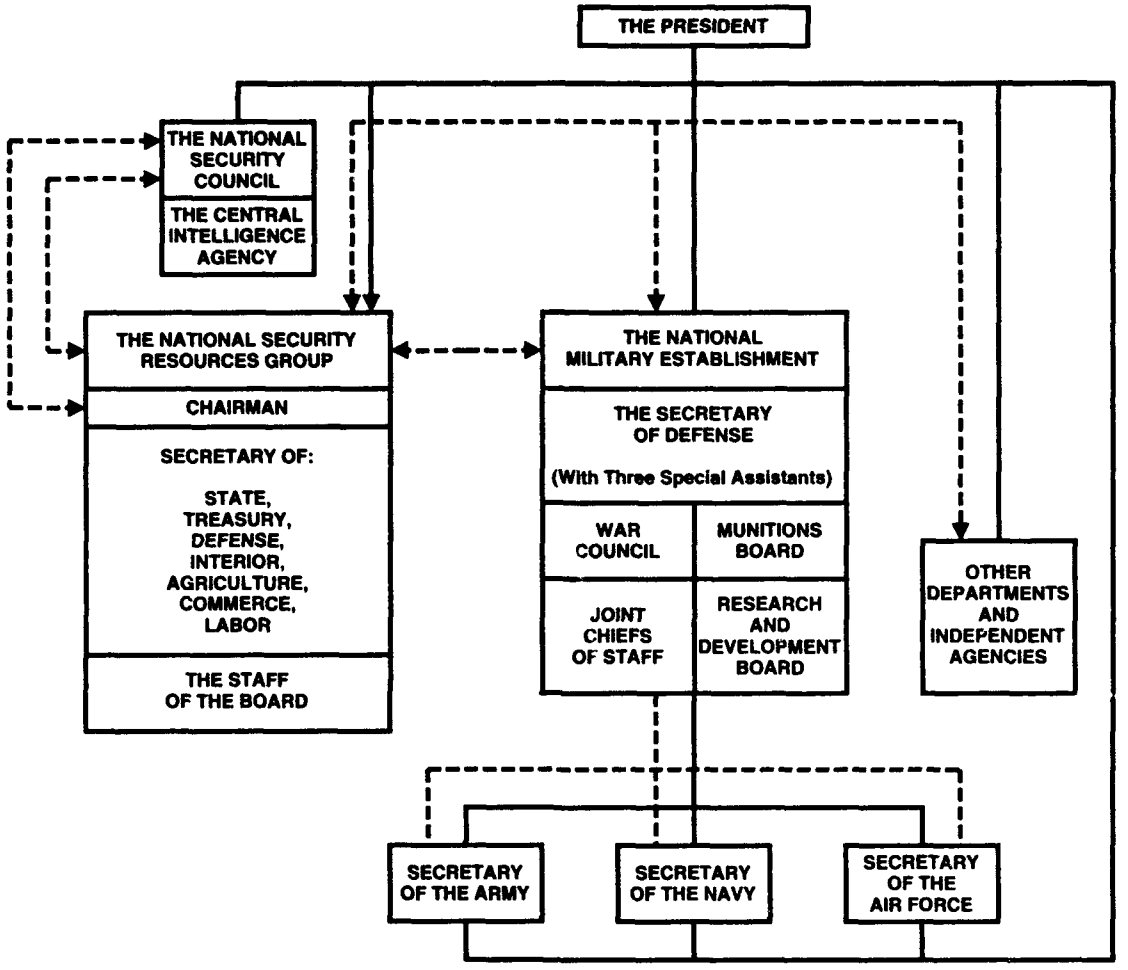


Figure 6. The Relationship of SAIMS to RMS



(Note: The permanent members of the DSARC are members of the DRB.)

Figure 7. Expanded Membership of the Defense Resources Board (DRB) Including the Defense Systems Acquisition Review Council (DSARC)



Note: Solid line indicates direction, authority and control; broken line indicates coordination.

Figure 8. The National Military Establishment and Its Relationship to the National Security Council and the National Security Resources Board

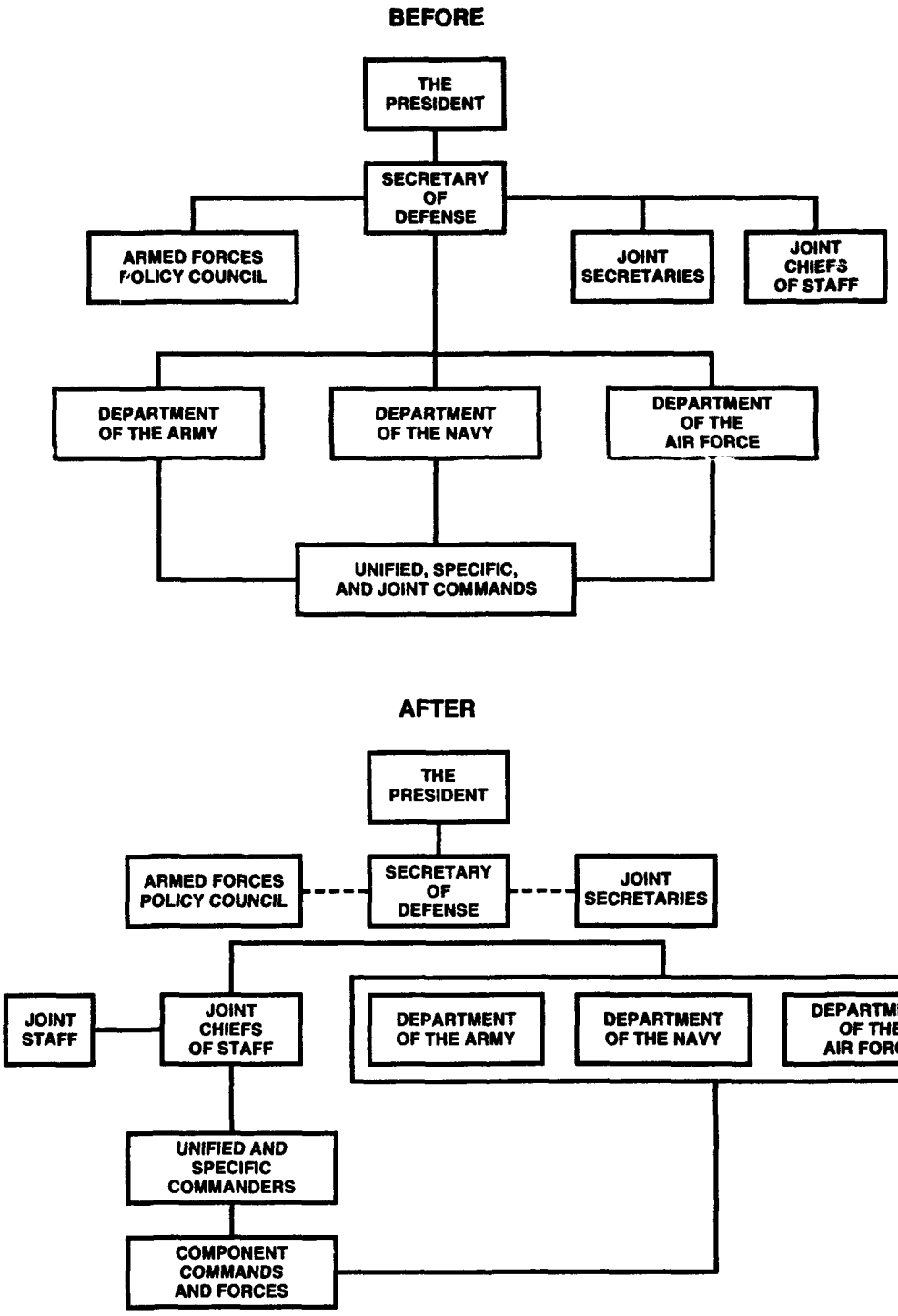


Figure 9. The Organization of the Department of Defense Before and After the Reorganization Act of 1958

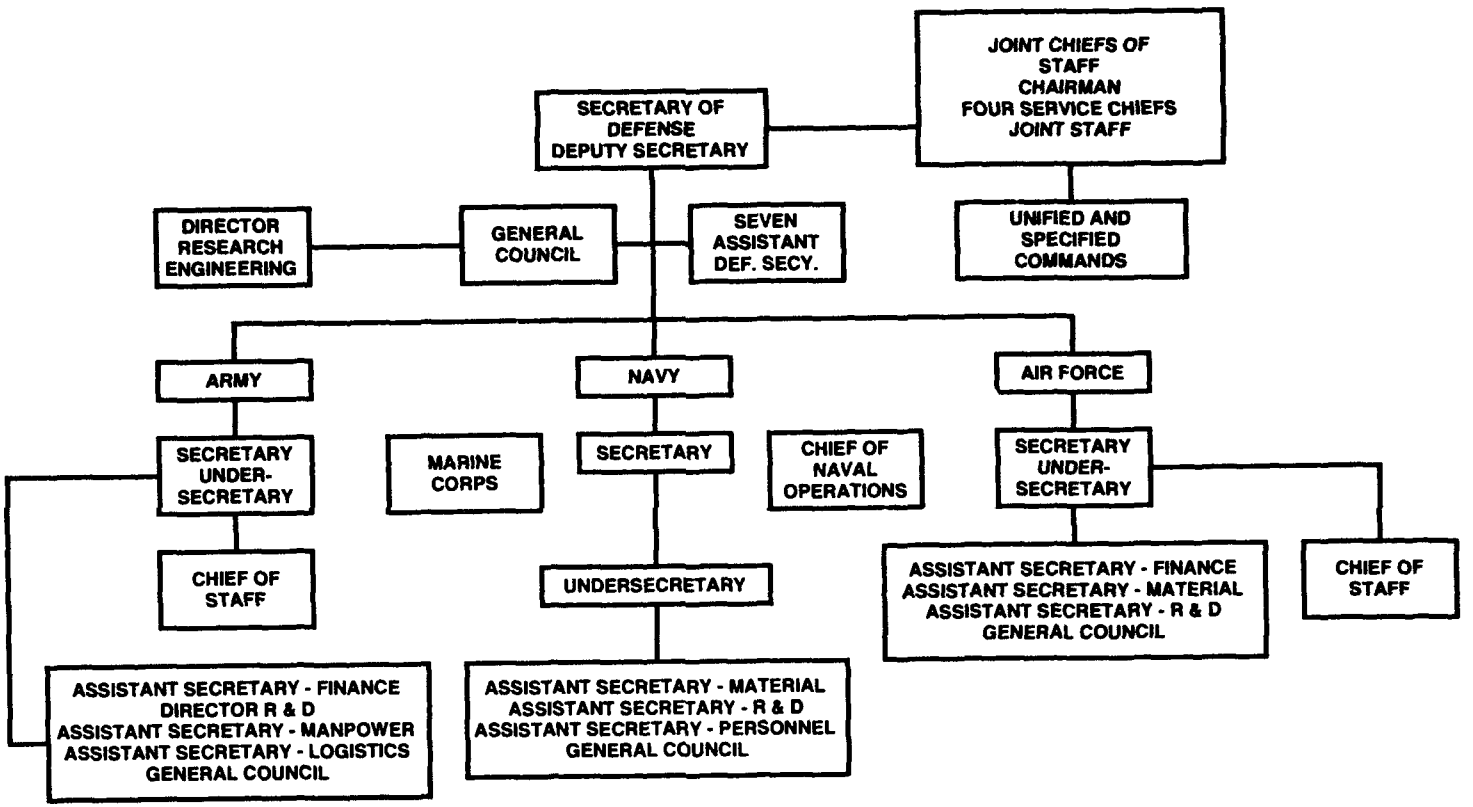


Figure 10. Organization of the Department of Defense when Senator Symington Proposed a Reorganization

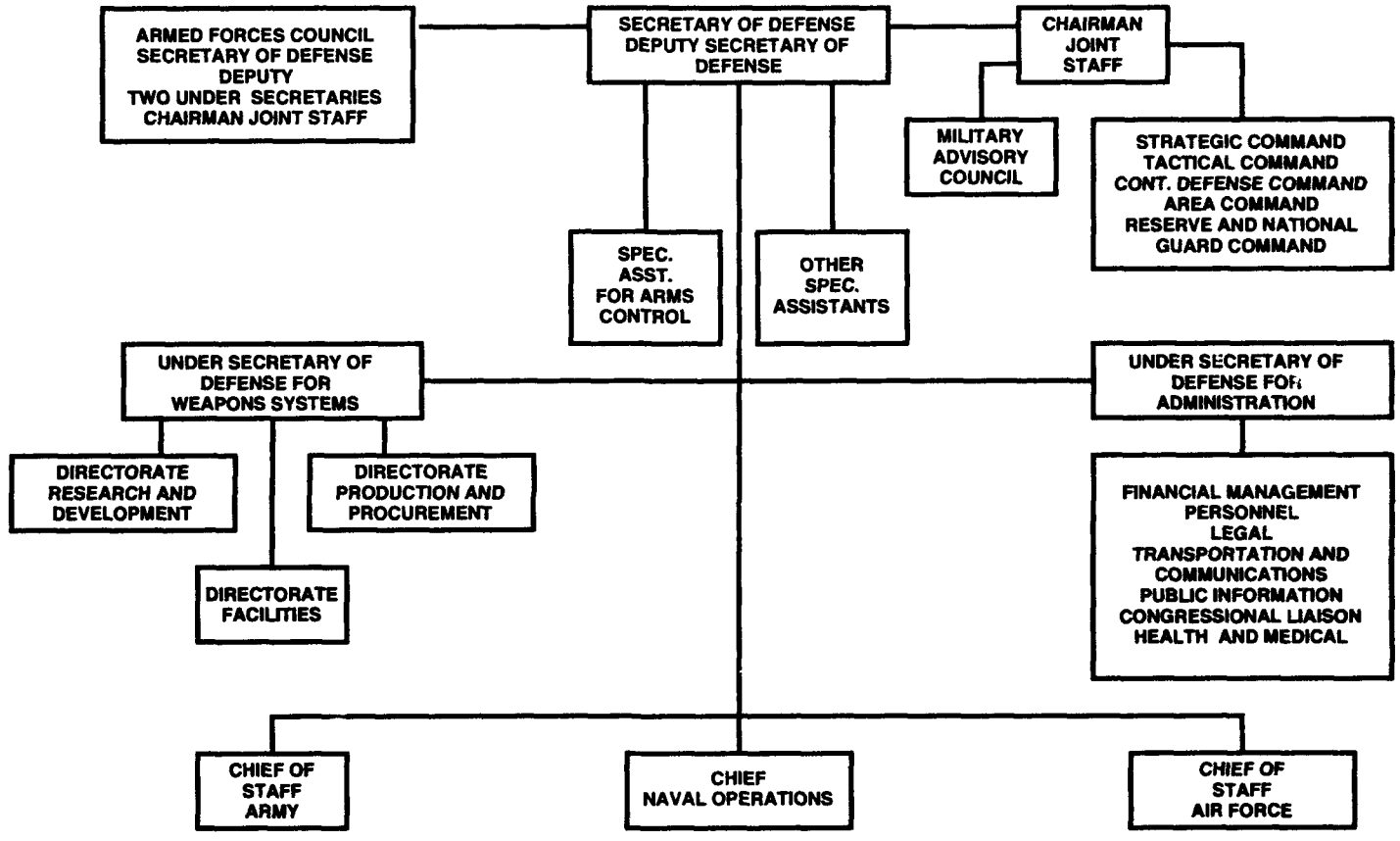


Figure 11. Senator Symington's Proposed Organization of the Department of Defense

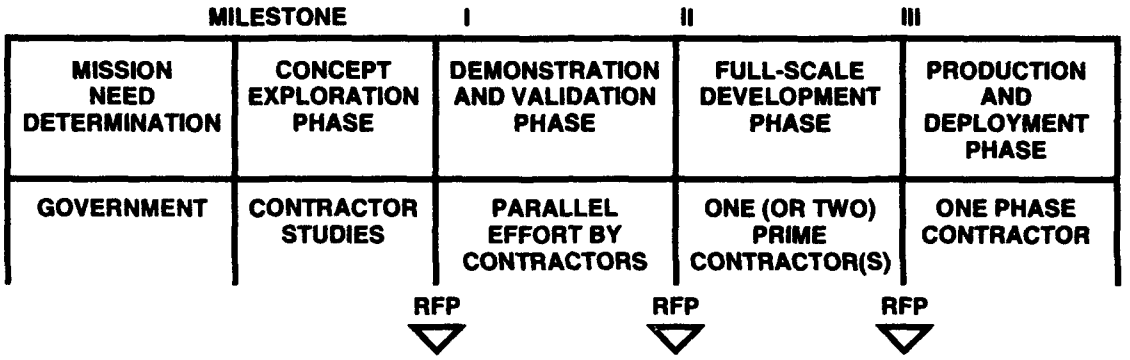


Figure 12. Major DOD System Life Cycle in the Fifties (As Envisioned by the Author)

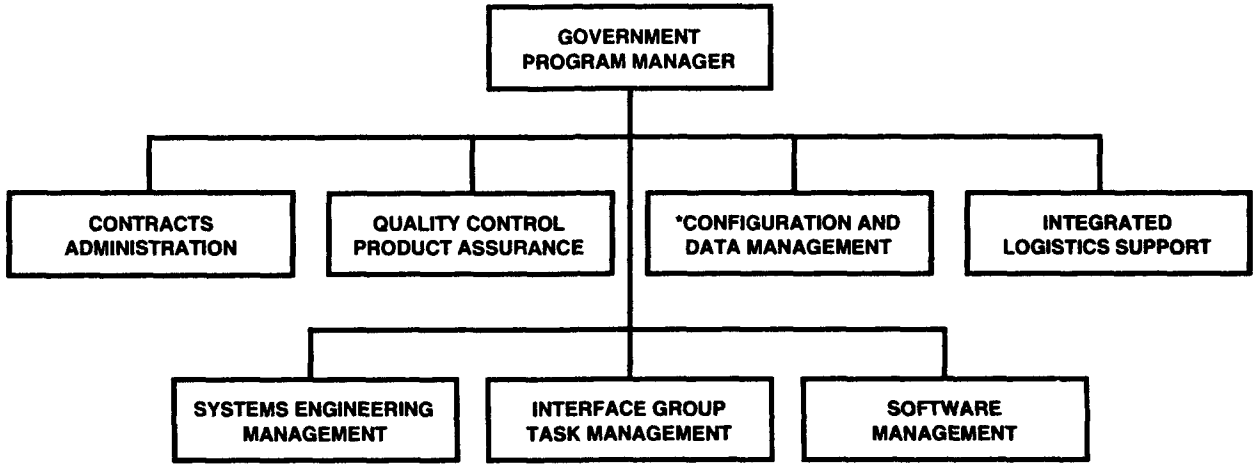


Figure 13. Organization of a Program Office

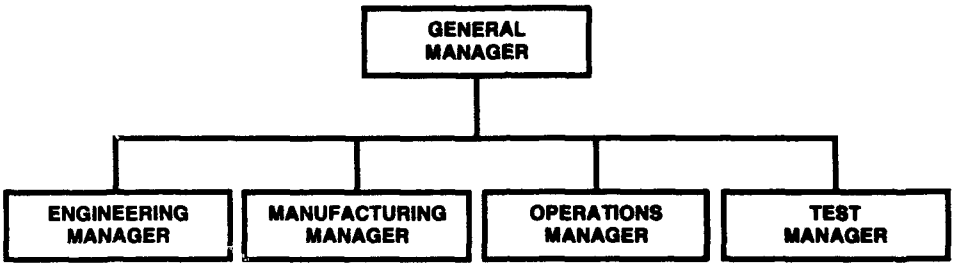


Figure 14. Functional Organization

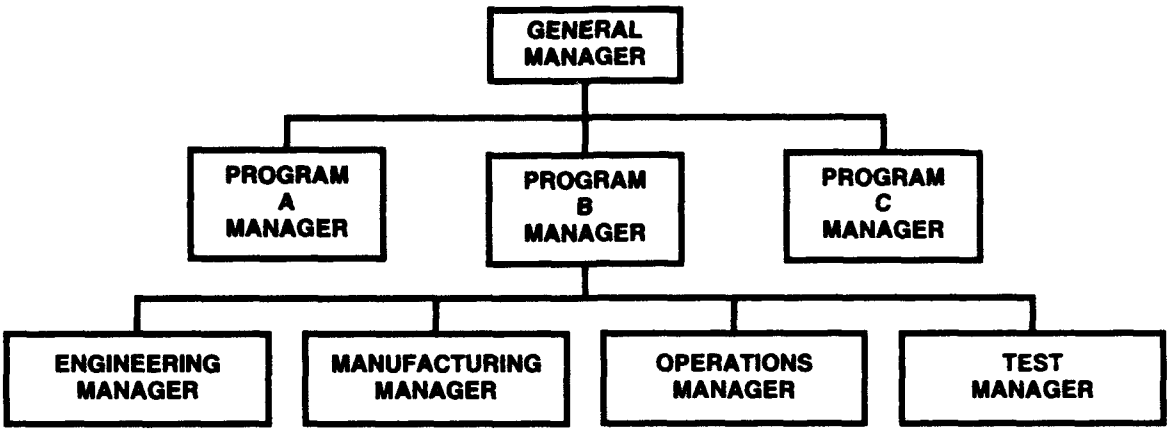


Figure 15. Project Organization

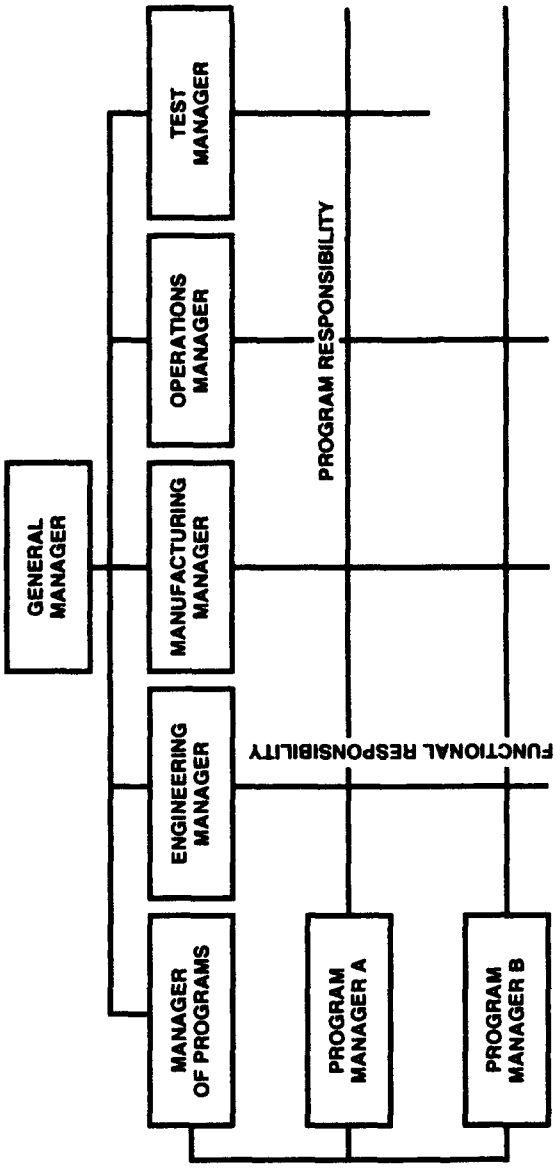


Figure 16. Matrix Management Organization

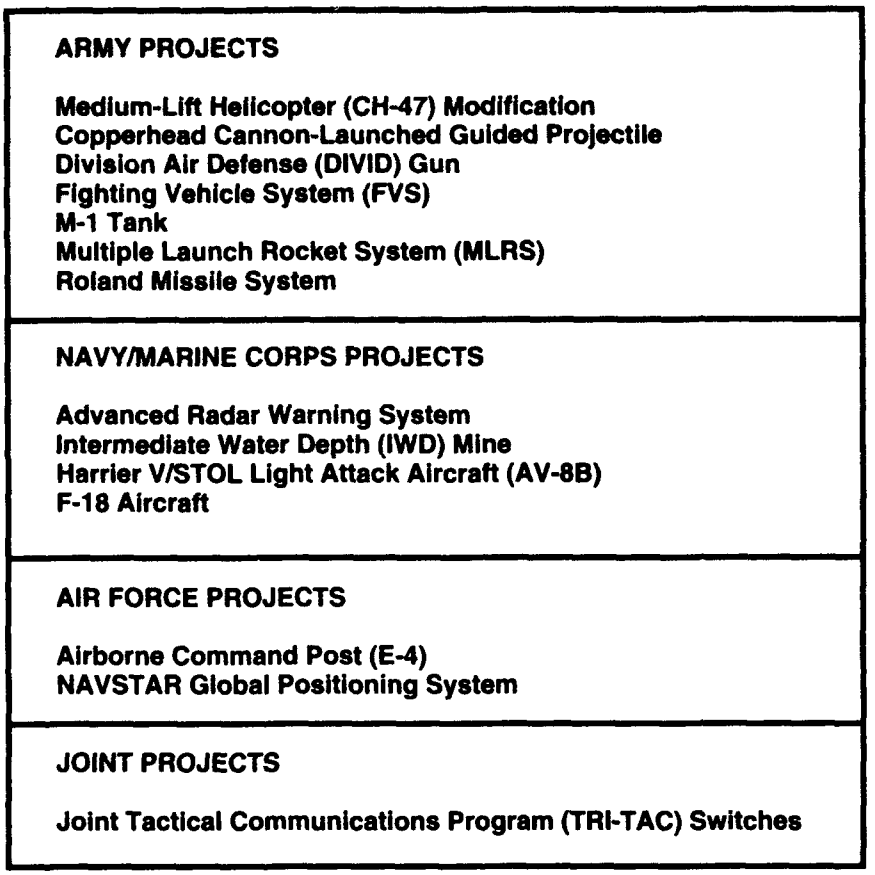
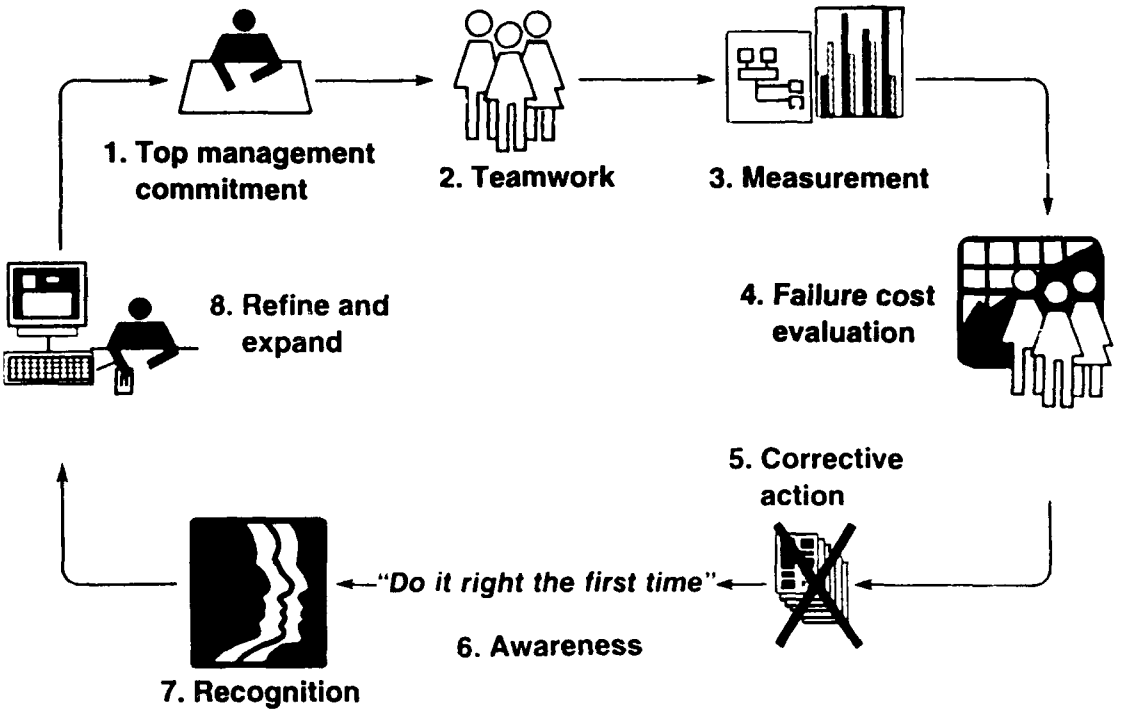


Figure 17. Projects on Which Actions Taken During PPBS Processing Resulted in a 15 Percent or Greater Change in Production Quantities Previously Authorized for Manufacture



Air Force Systems Command, June 1989

Figure 18. The TQM Process

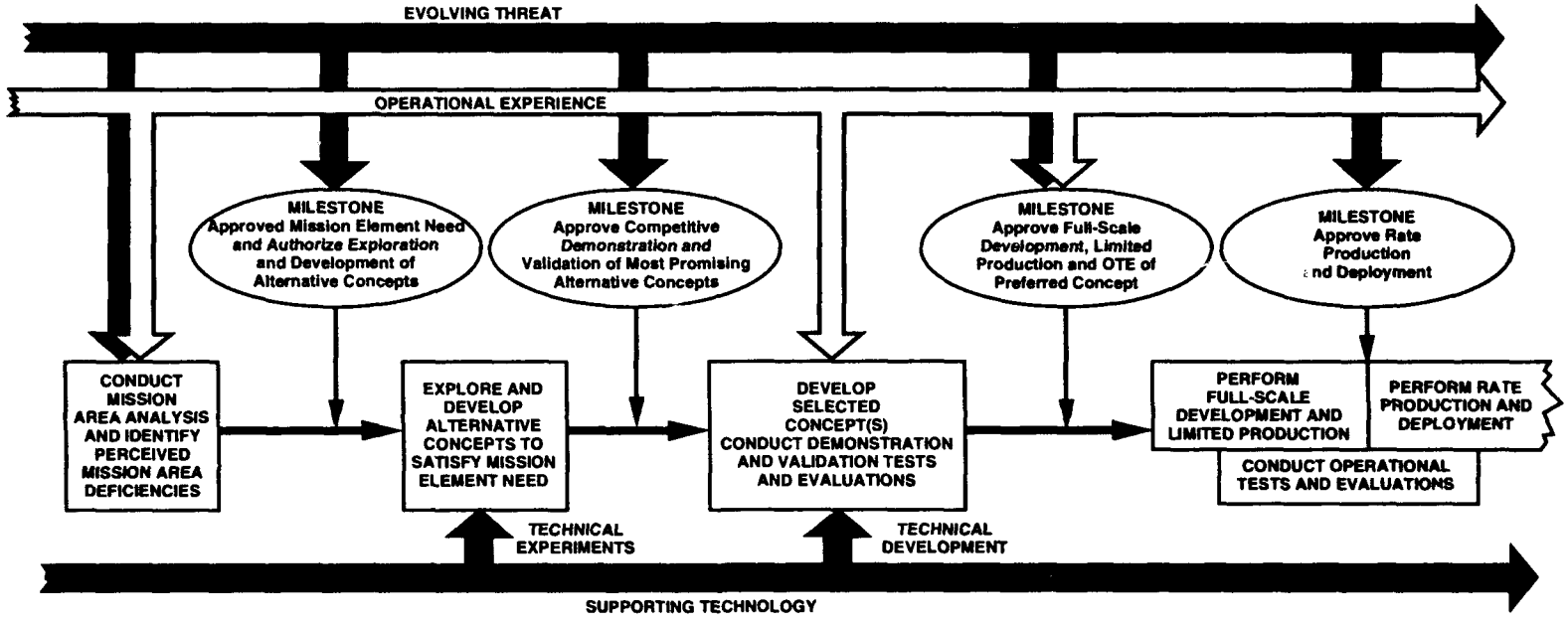
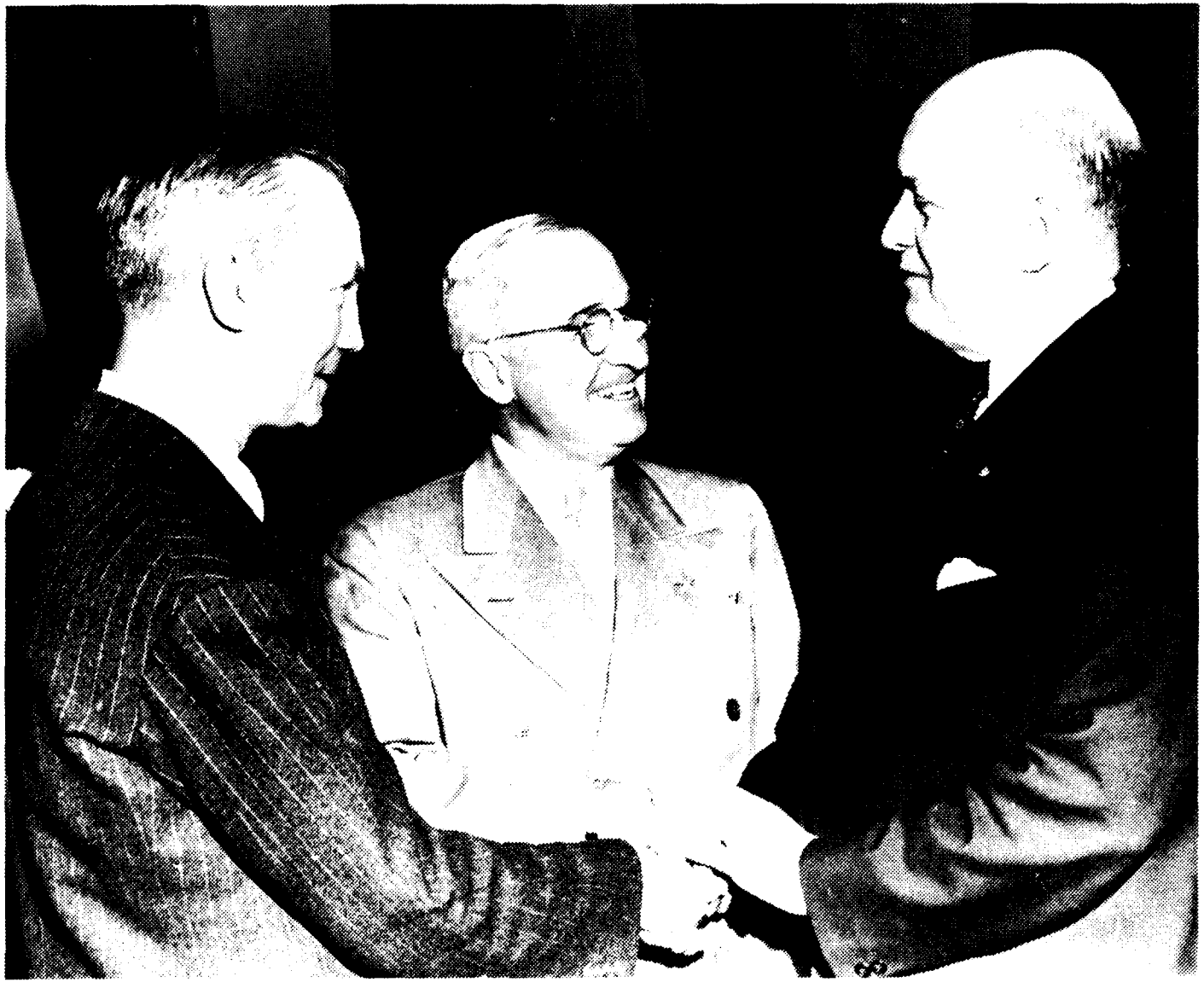


Figure 19. Anatomy of the Defense Systems Acquisition Process

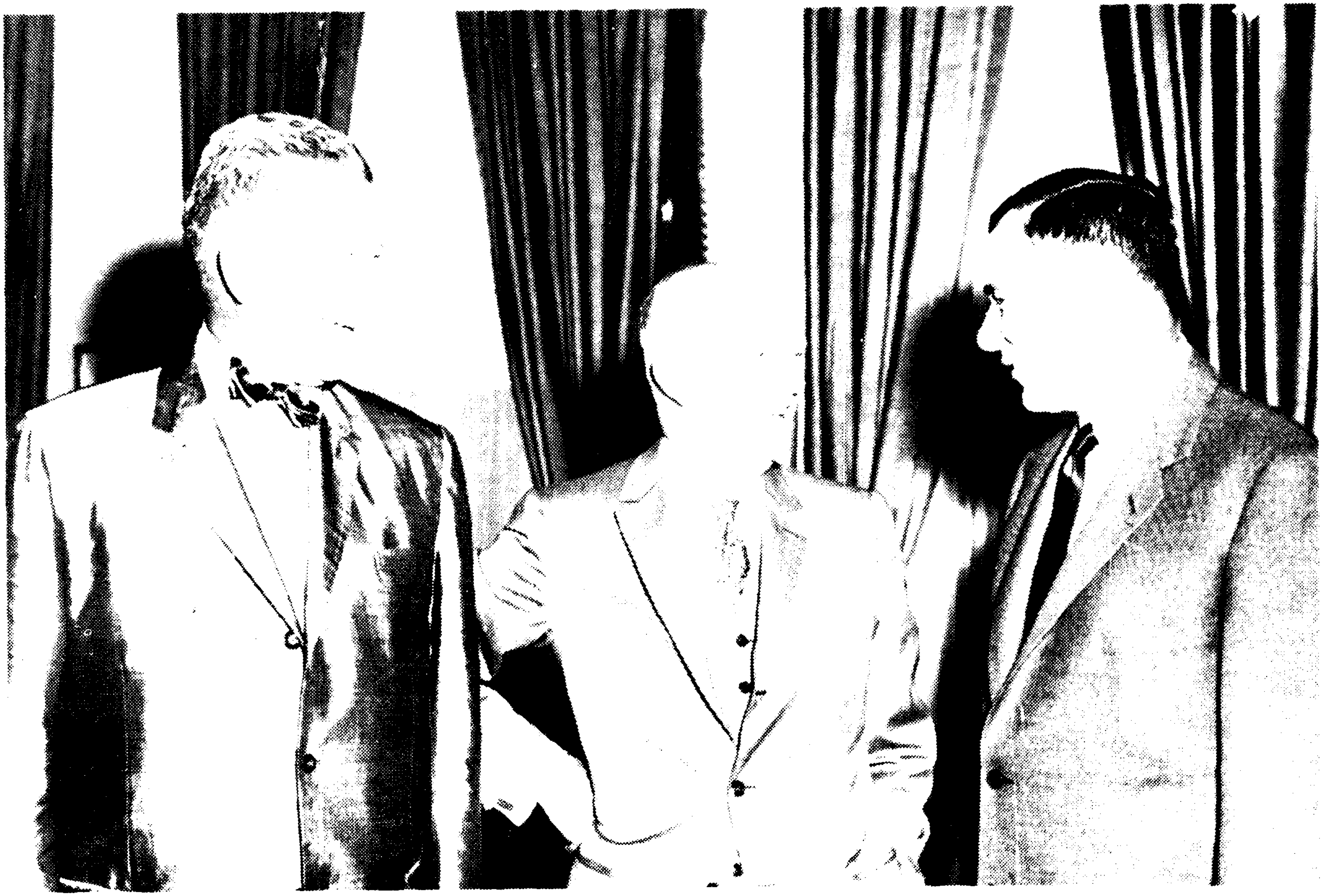
APPENDIX C

James V. Forrestal, First Secretary of Defense (1947–49)



President Harry S. Truman, incoming Secretary of Defense Louis A. Johnson (right) and James V. Forrestal, resigning Secretary of Defense (left), shown in a three-way handshake on March 4, 1949, in Washington, D.C., after the announcement of Mr. Johnson's appointment.

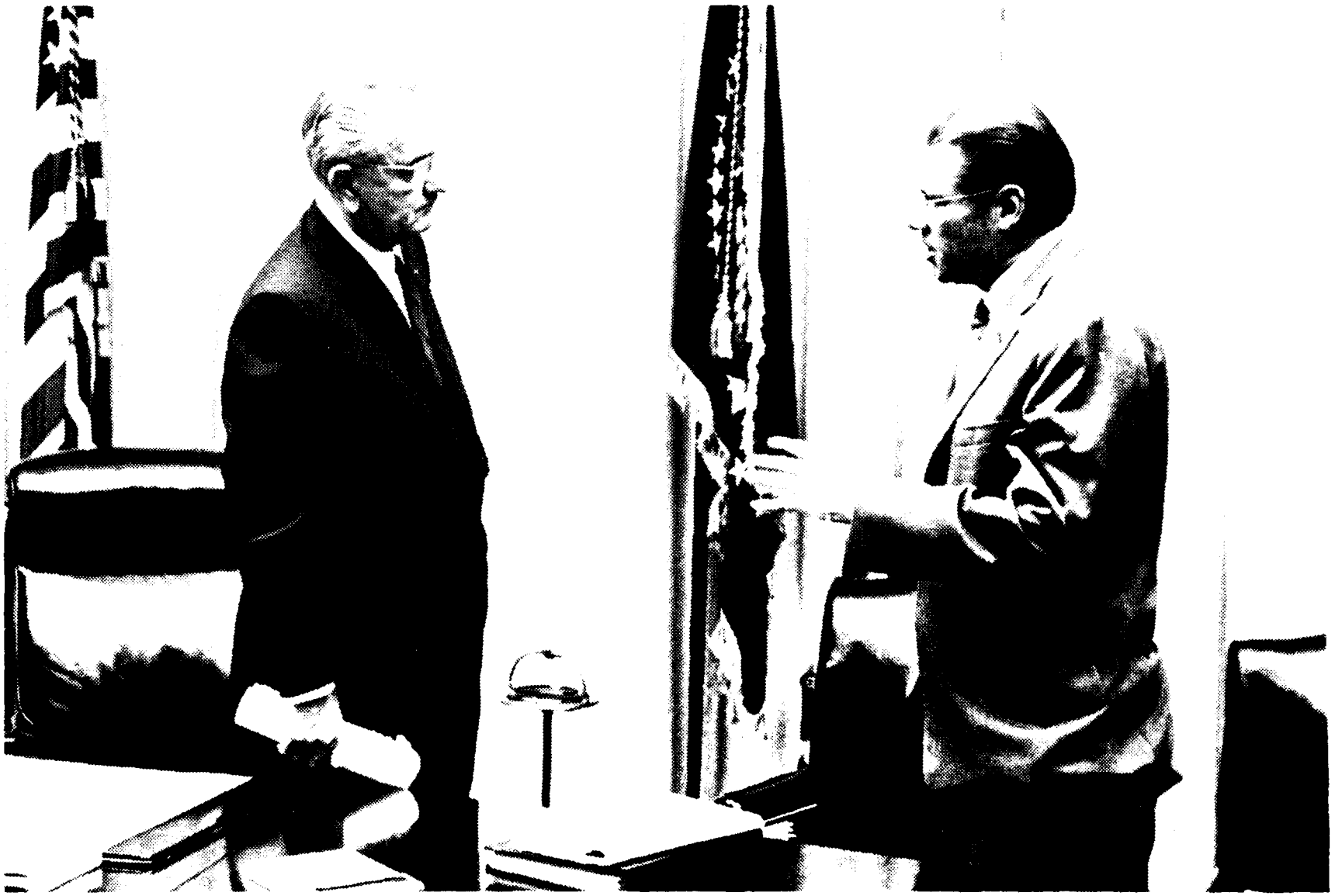
On November 12, 1951, President Harry S. Truman (left), Defense Secretary Designate Robert A. Lovett (right), and General George C. Marshall (center) are shown conferring at the White House several hours after President Truman accepted General Marshall's resignation from the Cabinet Post.



On May 19, 1959, President Dwight D. Eisenhower met with Secretary of Defense Neil McElroy (left) and Secretary of Navy Thomas Gates, Jr. [illegible]. The meeting occurred when Gates was selected as Deputy Secretary of Defense.

Seated, President Dwight D. Eisenhower and Secretary of Defense Charles E. Wilson (right).

President John F. Kennedy, Secretary of State Dean Rusk (left) and Secretary of Defense Robert S. McNamara (right) meet at the White House.



President Lyndon B. Johnson listens to Secretary of Defense Robert S. McNamara during a meeting at the White House.

President Lyndon B. Johnson and Secretary of Defense Clark M. Clifford.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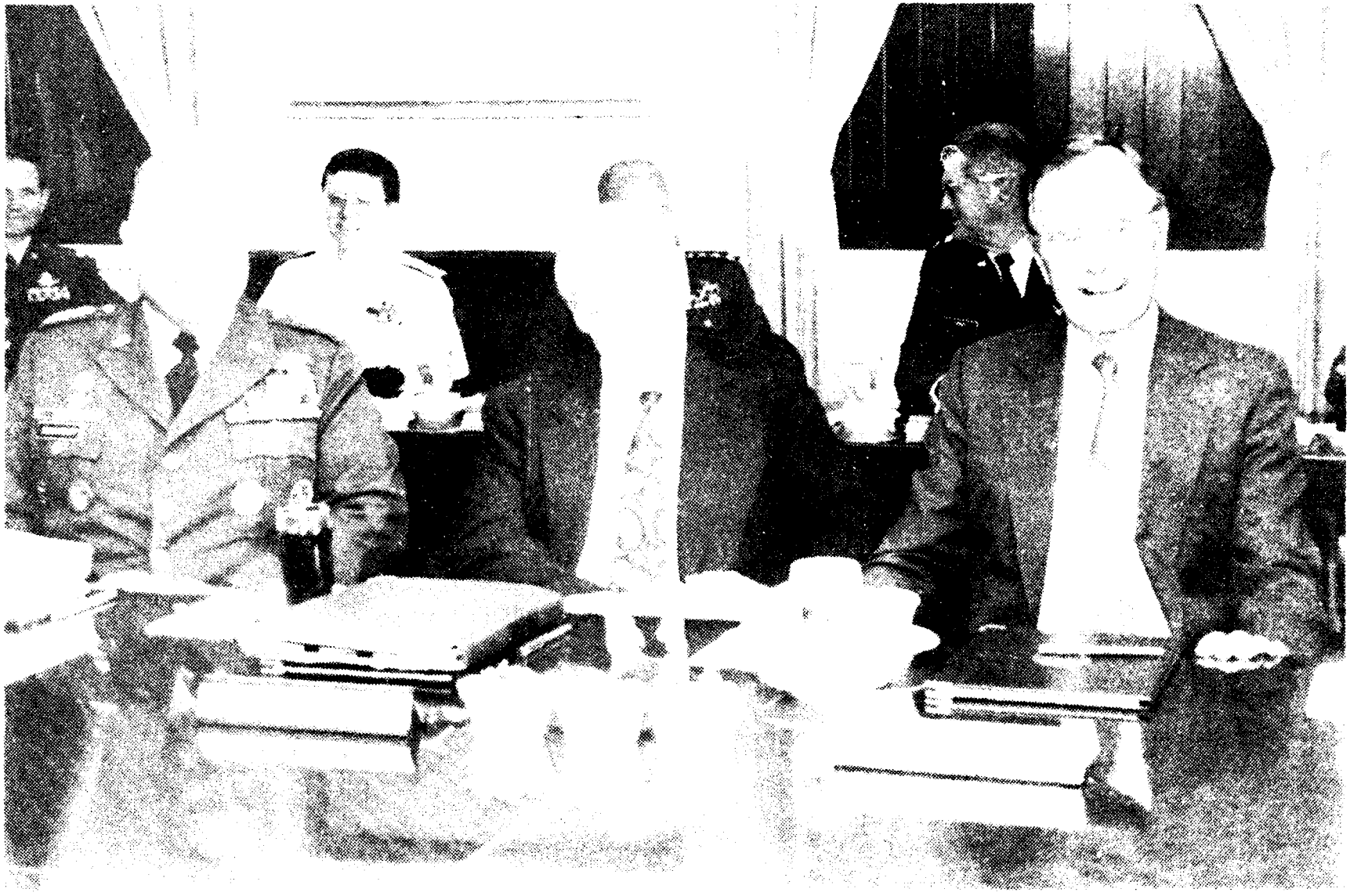
At a May 12, 1975, National Security Council meeting, Secretary Henry A. Kissinger (on right) discusses United States' options regarding the Mayaguez situation with President Gerald R. Ford, Secretary of Defense James R. Schlesinger (on Ford's left) and future Defense Secretary Donald H. Rumsfeld (next to Kissinger).

Secretary of Defense James R. Schlesinger and Secretary of State Henry A. Kissinger.

President Jimmy Carter talks with Defense Secretary Harold Brown in the Oval Office.

President Ronald Reagan, accompanied by Defense Secretary Frank C. Carlucci (right) and White House Chief of Staff Howard Baker (left).

President Ronald W. Reagan and Secretary of Defense Caspar W. Weinberger.



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